

MATERIALS TOWARD A MONOGRAPH OF THE GENUS CITHAREXYLUM. II

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1. Modern living species.
2. Branches and branchlets armed with spines. Section I. Spinosa Walp.
 3. Spines often absent from the twigs; leaf-blades very firmly chartaceous, barbellate in the axils of the secondaries beneath; Brazil, Argentina, Paraguay, and Uruguay.....
C. montevidense.
 - 3a. Spines conspicuous even on twigs; leaf-blades chartaceous or submembranous, not barbellate beneath; Bolivia and Peru.
 4. Branches and branchlets very acutely tetragonal, conspicuously 4-margined, straight, not especially stiff; nodes conspicuously annulate.
 5. Leaf-blades mostly serrate, chartaceous, densely impressed-punctate beneath; Peru.....*C. herrerae*.
 - 5a. Leaf-blades entire, submembranous, not impressed-punctate beneath; Bolivia and Peru.....*C. andinum*.
 - 4a. Branches and branchlets mostly obtusely tetragonal or subterete, not margined, often more or less flexuous, very stiff; nodes usually obscurely annulate.
 6. Leaves glabrous or only slightly appressed-pilose along the midrib beneath.....*C. psilacanthum*.
 - 6a. Leaves rather densely pubescent beneath.
 7. Petioles 1--3 mm. long; branches usually not flexuous; leaf-blades 0.7--1.7 cm. long, 3.5--10 mm. wide; racemes to 1 cm. long.....*C. weberbaueri*.
 - 7a. Petioles 3--15 mm. long; branches mostly flexuous; leaf-blades 2.2--5.8 cm. long, 7--30 mm. wide; racemes 1.5--2.5 cm. long.....*C. flexuosum*.
- 2a. Branches and branchlets not armed. Section II. Inermia Walp.
 8. Leaves very small, 2--15 mm. long, 1--4 mm. wide, sessile, clustered on abbreviated spurs; plants with the aspect of Lycium barbinode; Mexico and Texas.
 9. Leaf-blades densely canescent-pubescent on both surfaces
C. brachyanthum.
 - 9a. Leaf-blades glabrous on both surfaces...*C. spatulatum*.
 - 8a. Leaves mostly larger, usually petiolate; plants not with the aspect of Lycium barbinode.
 10. Leaf-blades linear, linear-oblong, or linear-oblongate.
 11. Racemes 1--3 cm. long, with numerous flowers; leaf-blades firmly chartaceous or subcoriaceous when mature; vein and veinlet reticulation prominulous and conspicuous throughout on both surfaces; Haiti.....
C. stenophyllum.
 - 11a. Racemes very much abbreviated, 1--5-flowered, incon-

- spicuous; leaf-blades chartaceous or membranous; vein and veinlet reticulation obscure.
12. Leaf-blades densely strigillose-roughened on both surfaces with minute albidous bulbous-based hairs. C. shrevei.
- 12a. Leaf-blades smooth or merely punctate on both surfaces, not strigillose-roughened.
13. Mexican; branches blackish; fruiting-pedicels 4--7 mm. long; fruiting-calyx indurated, 2.5--3 mm. long and 4.5--5 mm. wide.....C. lycioides.
- 13a. Haitian; branches very light-colored; fruiting-pedicels greatly abbreviated; fruiting-calyx about 2 mm. long and 4 mm. wide.....C. microphyllum.
- 10a. Leaf-blades not as above.
14. Leaves ternate or quaternate.
15. Leaves ternate; leaf-blades not tomentose.
16. Leaf-blades sharply toothed.....C. quercifolium.
- 16a. Leaf-blades entire.
17. Native to Cuba and Central America.
18. Leaf-blades 9.8--25 cm. long, 5.5--9.2 cm. wide, broadly elliptic-oblong or subobovate; petioles 2--3.7 cm. long; Panama.....C. macrochlamys.
- 18a. Leaf-blades 5--16.2 cm. long, 2.4--5.5 cm. wide, lanceolate, lanceolate-oblong, elliptic, narrowly oblong-elliptic, or nearly oblong; petioles 0.6--1.9 cm. long.
19. Cuban; leaf-blades very shiny above, dark-green; peduncles and rachis glabrous.....C. ternatum.
- 19a. Central American; leaf-blades dull, grayish-green; peduncles and rachis puberulent.....C. hexangulare.
- 17a. Native to South America.
20. Leaf-blades subtruncate at the base; Brazil.....C. subtruncatum.
- 20a. Leaf-blades short-acuminate, acute, or rounded at the base.
21. Leaf-blades 1.5--3 cm. wide, grayish-green; Paraguay.....C. rigidum.
- 21a. Leaf-blades 3.3--12.3 cm. wide, dark-green.
22. Petioles 1--4 cm. long; leaf-blades firmly chartaceous.
23. Leaf-blades ovate or ovate-elliptic.....C. poeppigii var. margaritaceum.
- 23a. Leaf-blades elliptic, elliptic-oblong, oblong, or subobovate.
24. Mature leaf-blades densely short-pubescent beneath.....C. poeppigii.
- 24a. Mature leaf-blades minutely puberulent or glabrous beneath or hirtellous along the larger venation only.
25. Mature flowers 14.5 mm. long; Colombia and Guiana.....C. macrophyllum.

- 25a. Mature flowers 11.8 mm. long; Brazil and Ecuador.
26. Leaf-blades hirtellous along the larger venation beneath.....C. ulei.
- 26a. Leaf-blades completely glabrous beneath.
C. ulei var. calvescens.
- 22a. Petioles 5--6.5 cm. long; leaf-blades thin-chartaceous or membranous.....C. amazonicum.
- 15a. Leaves quaternate; leaf-blades densely tomentose beneath; exceptional form.....C. kunthianum.
- 14a. Leaves not ternate nor quaternate.
27. Leaves alternate.....C. obtusifolium.
- 27a. Leaves decussate-opposite, rarely subopposite or approximate on young shoots.
28. Leaf-blades dentate along the margins.
29. Leaf-blades coriaceous or subcoriaceous.
30. Racemes greatly abbreviated, to 4 cm. long, mostly much less.
31. Leaf-blades merely subcoriaceous.
32. Branchlets and twigs mostly verruculose with numerous prominent lenticels; leaves blackening in drying; mature leaf-blades 7--12 mm. wide.....
C. pachyphyllum.
- 32a. Branchlets and twigs not verruculose; leaves not discoloring in drying; mature leaf-blades 8--40 mm. wide.....C. ilicifolium.
- 31a. Leaf-blades firmly coriaceous or leathery-coriaceous.
33. Leaf-blades extremely heavy leathery-coriaceous and stiff, usually nigrescent or brunnescent in drying; racemes 1--3.5 cm. long, mostly with numerous flowers.....C. dentatum.
- 33a. Leaf-blades not so extremely heavy and stiff, not discoloring in drying; racemes greatly abbreviated, 1--5-flowered.
34. Leaf-blades deeply impressed-punctate on both surfaces; teeth few, small, appressed, obscure, often absent.....C. punctatum.
- 34a. Leaf-blades impressed-punctate only beneath; teeth very large, divergent, conspicuous, always present.....C. argutedentatum.
- 30a. Racemes elongate, 4--25 cm. long.
35. Vein and veinlet reticulation obscure on both surfaces or even indiscernible; Mexico.C. ligustrinum.
- 35a. Vein and veinlet reticulation conspicuous.
36. Peduncles and rachis very stout and strong, erect; pedicels obsolete; Peru and Bolivia.....
C. laurifolium.
- 36a. Peduncles and rachis slender during anthesis, often nutant; pedicels 1--2 mm. long.
37. Midrib and secondaries deeply impressed above

- or sharply prominent within a rather deep channel; racemes to 2.4 cm. wide during anthesis; calyx about 4.1 mm. long and 3.9 mm. wide; corolla about 8.3 mm. long; Colombia.....C. sulcatum.
- 37a. Midrib and secondaries plane or conspicuously prominent above; racemes about 1.3 cm. wide during anthesis; calyx and corolla smaller; Peru.....C. suberosum.
- 29a. Leaf-blades chartaceous or membranous.
38. Leaf-blades decidedly scabrous above.....C. scabrum.
- 38a. Leaf-blades not scabrous above.
39. Leaf-blades small, 0.6--7.2 cm. long, 0.7--4.5 cm. wide.
40. Leaf-blades flabelliform.....C. flabellifolium.
- 40a. Leaf-blades not flabelliform.
41. Native to South America.
42. Leaf-blades densely punctate beneath; flowers yellow; Argentina.....C. jurgensenii.
- 42a. Leaf-blades not punctate; flowers white; Brazil...C. reitzii.
- 41a. Native to Mexico and southern United States.
43. Racemes densely many-flowered; branches, branchlets, and twigs light-gray.....C. berlandieri.
- 43a. Racemes 1--5-flowered; branchlets and twigs dark-brown or black.
44. Petioles to 14 mm. long; leaf-blades not revolute, their teeth mostly absent.....C. altamiranum.
- 44a. Petioles to 6 mm. long; leaf-blades coarsely and deeply dentate with large, antrorse, often lobelike teeth, revolute at the margins.C. endlichii.
- 39a. Leaf-blades larger, 2.2--29 cm. long, 1.3--11.3 cm. wide.
45. Leaf-blades very firmly chartaceous and stiff; vein and veinlet reticulation very prominent and conspicuous on both surfaces.
46. Teeth regularly present and confined to the apical portion of the leaf-blades, small and more or less appressed-antrorse.....C. fruticosum var. subserratum.
- 46a. Teeth present only on occasional watersprout leaves and then very large, coarse, divergent-patent, and not confined to the apical portion of the leaf.
47. Leaf-blades glabrous beneath.....C. fruticosum.
- 47a. Leaf-blades villous-pubescent or velutinous beneath.....C. fruticosum var. villosum.
- 45a. Leaf-blades thin-chartaceous or membranous, not stiff; vein and veinlet reticulation usually not as above.
48. Leaf-blades glabrous or subglabrate beneath.
49. Leaf-blades bicolored, very dark above, very light beneath; vein and veinlet reticulation conspicuous beneath by being darker, but not in the slightest degree prominent; leaf-blades extremely thin-membranous and fragile.....C. discolor.
- 49a. Leaf-blades not noticeably bicolored, usually

chartaceous; vein and veinlet reticulation not as above.

50. Leaf-blades narrow, lanceolate or oblong-lanceolate.....

C. donnell-smithii.

50a. Leaf-blades broad, from elliptic, elliptic-oblong, or oblong to ovoid or subrhomboid.

51. Petioles to 2.4 cm. long; pedicels to 4 mm. long; West Indies to the Guianas.....C. spinosum.

51a. Petioles to 4.2 cm. long; pedicels to 2 mm. long; Mexico.....C. mexicanum.

48a. Leaf-blades variously pubescent beneath.

52. Leaf-blades merely puberulent beneath.

53. Leaf-blades decidedly membranous and bicolored, very dark above, very light beneath; vein and veinlet reticulation conspicuous beneath by its darker color, but not the least prominulous; Cuba and Hispaniola.....C. discolor.

53a. Leaf-blades chartaceous, not membranous; vein and veinlet reticulation not as above; Mexico.....

C. affine var. glanduliferum.

52a. Leaf-blades pubescent, pilose, hirsute, or velutinous beneath.

54. Leaf-blades ovate, broadly rounded at the base, not South American.

55. Leaf-blades acuminate at the apex, to 12.5 cm. long and 6.5 cm. wide.

56. Mexican; leaf-blades permanently short-pubescent on the lamina beneath; branchlets densely pubescent.....

C. ovatifolium.

56a. Cuban; leaf-blades strigillose-pubescent only in distichous fashion along the larger venation beneath; branchlets obsoletely puberulent or glabrate.....

C. ekmani.

55a. Leaf-blades acute at the apex, to 9 cm. long and 4.5 cm. wide.....C. pentandrum.

54a. Leaf-blades not ovate, from acute or acuminate to cuneate at the base; South American.

57. Brazilian; leaf-blades lanceolate-oblong or elliptic, densely hirsute-tomentose or velutinous-pubescent beneath; fruiting-calyx about 6 mm. long and 12 mm. wide; fruit about 14 mm. long and 12 mm. wide..C. solanaceum.

57a. Colombia, Venezuela, and Ecuador; fruiting-calyx 2.5--3 mm. long and 5--9 mm. wide; fruit 5--9 mm. long and 5--7 mm. wide.

58. Ecuador; leaf-blades densely incanous-tomentose beneath, broadly oblong-elliptic or suborbicular, not at all falcate.....C. quitense.

58a. Colombia and Venezuela; leaf-blades merely pubescent, hirtellous, or subvelutinous (and not incanous) beneath, often more or less falcate.

59. Pubescence, especially on the lower leaf-surface, velutinous, very dense.....C. karsteni.

59a. Pubescence, especially on the lower leaf-surface,

not velutinous, short, often sparse....

C. dawei.

28a. Leaf-blades entire.

60. Leaf-blades glabrous or subglabrate beneath when mature, rarely pulverulent-punctate or pilosulous on the midrib.

61. Racemes abbreviated, few-flowered.

62. Leaf-blades narrow, linear-oblancoolate or narrowly elliptic-spatulate to narrowly oblong, oblong-oblancoolate, or oblancoolate.

63. Hispaniola; leaf-blades mostly membranous.....
C. microphyllum.

63a. Mexico; leaf-blades chartaceous, often firm.

64. Twigs acutely tetragonal; fruiting-pedicels 4--7 mm. long; leaf-blades thin-chartaceous; sterigmata present on older branchlets.

65. Leaf-blades densely impressed-punctate beneath, linear-oblong.....C. lycioides.

65a. Leaf-blades not impressed-punctate beneath, elliptic.....C. racemosum.

64a. Twigs subterete; fruiting-pedicels obsolete or to 3 mm. long; leaf-blades firmly chartaceous; sterigmata absent.

66. Petioles obsolete or to 1 mm. long; leaf-blades to 4 cm. long and to 0.8 cm. wide..C. tetramerum.

66a. Petioles 1.5--5 mm. long; leaf-blades to 8.5 cm. long and to 2.8 cm. wide.....C. oleinum.

62a. Leaf-blades broader, oblong or elliptic.

67. Leaf-blades deeply impressed-punctate above.....
C. punctatum.

67a. Leaf-blades not impressed-punctate above.

68. Mature leaves becoming brunnescent or nigrescent in drying; branches, branchlets, and twigs verruculose; vein and veinlet reticulation usually plane or indiscernible above.....C. pachyphyllum.

68a. Mature leaves usually not discoloring in drying; branches, branchlets, and twigs not verruculose; vein and veinlet reticulation conspicuous and quite prominulous above.....C. ilicifolium.

61a. Racemes elongate, many-flowered.

69. Branches and branchlets conspicuously 4-ate or 4-margined.

70. South American.....C. vallense.

70a. Central American.

71. Branches and branchlets mostly merely more or less acutely tetragonal, very shortly 4-ate-margined only on exceptional vigorous specimens; leaf-blades lanceolate-elliptic or ovate, usually not glanduliferous at the base.....C. affine.

71a. Branches and branchlets always conspicuously 4-ate; leaf-blades larger, elliptic, glanduliferous at the base.....C. pterocladum.

- 69a. Branches and branchlets not conspicuously 4-alate-margined.
72. Leaf-blades mucronate-cucullate at the apex.
73. Leaf-blades narrowly oblong, usually 5--6 times as long as wide.....C. mucronatum.
- 73a. Leaf-blades obovate or elliptic, usually only 1 1/2 to 2 times as long as wide.....C. ellipticum.
- 72a. Leaf-blades not mucronate-cucullate at the apex.
74. Leaf-blades membranous, often very thin and fragile.
75. Native to Mexico.
76. Nodes distinctly annulate; leaf-blades mostly small and narrow and more or less lanceolate-elliptic or ovate; vein and veinlet reticulation usually more or less obscure beneath.....C. affine.
- 76a. Nodes very obscurely annulate; leaf-blades mostly larger and broader, oblong-elliptic or ovoid to sub-rhomboid; vein and veinlet reticulation conspicuous beneath.....C. mexicanum.
- 75a. Not Mexican.
77. Leaf-blades large and broad, to 29 cm. long and 11.3 cm. wide.
78. Mature leaf-blades uniformly colored on both surfaces, mostly firm; West Indies to the Guianas and Panama.....C. spinosum.
- 78a. Mature leaf-blades much lighter beneath, very thin-membranous; Ecuador and Peru...C. chartaceum.
- 77a. Leaf-blades smaller and narrower, to 11.7 cm. long and 4.5 cm. wide.
79. Mature leaf-blades decidedly bicolored, very dark above in drying, very light beneath; peduncles and rachis glabrous; Hispaniola.....C. discolor.
- 79a. Mature leaf-blades not bicolored; peduncles and rachis densely puberulent or short-pubescent and canescent; Trinidad and Cedros.....
C. fruticosum var. brittonii.
- 74a. Leaf-blades chartaceous, subcoriaceous, or coriaceous.
80. Leaf-blades rounded at the base.
81. Leaf-blades large, 10.5--21.5 cm. long, 7.2--10.3 cm. wide; vein and veinlet reticulation equally prominulous and conspicuous on both surfaces; Costa Rica....
C. costaricense.
- 81a. Leaf-blades small, 3.2--7.3 cm. long, 1.6--3.2 cm. wide; vein and veinlet reticulation usually almost indiscernible above, not at all prominulous beneath; Mexico.....C. gleoniarum.
- 80a. Leaf-blades acute, acuminate, or cuneate at the base.
82. Native to the West Indies and Florida.
83. Vein and veinlet reticulation very abundant, very conspicuous and prominent on both surfaces.
84. Leaf-blades dull above, not shiny.
85. Leaf-blades usually rounded and emarginate or subcucullate at the apex, not discoloring in

- in drying; venation very strong.....C. ellipticum.
- 85a. Leaf-blades usually acute at the apex, nigrescent above in drying (especially the younger ones); venation slender.....C. albicaule.
- 84a. Leaf-blades very shiny above.
86. Leaf-blades linear or lanceolate to oblanceolate, often falcate.....C. fruticosum var. smallii.
- 86a. Leaf-blades usually oblong or elliptic, not at all falcate.
87. Leaf-blades usually small, 2--6 cm. long, 1.5--3.5 cm. wide, mostly obtuse or only subacute at the apex, usually undulate or sinuate to sharp-serrate at the apex or from the apex to the middle; Cuba and Hispaniola.....C. fruticosum var. subseriatum.
- 87a. Leaf-blades usually larger, 4.5--21 cm. long, to 8 cm. wide, mostly short-acuminate or acute at the apex, uniformly entire (except on sprouts); widely distributed.....C. fruticosum.
- 83a. Vein and veinlet reticulation usually rather obscure, at least above, or only very slightly prominulous.
88. Leaf-blades pronouncedly and rather long-acuminate at the apex, lanceolate or narrowly ovate; racemes mostly compound with 3 branches.....C. tristachyum.
- 88a. Leaf-blades mostly acute or obtuse (rarely very bluntly short-acuminate) at the apex, mostly oblong or elliptic; racemes usually simple.
89. Vein and veinlet reticulation abundant, usually plainly visible (although but very slightly prominulous) on both surfaces; leaf-blades usually broadly elliptic or elliptic-oblong.....C. spinosum.
- 89a. Vein and veinlet reticulation very sparse and distant, usually obscure (or the smaller parts even indiscernible) above or on both surfaces; leaf-blades usually narrowly oblong or narrowly elliptic.....C. caudatum.
- 82a. Not native to Florida or the West Indies.
90. Native to Mexico and Central America.
91. Veins and veinlets numerous, mostly more or less conspicuous and prominulous on both surfaces.
92. Leaf-blades extremely shiny above, appearing glossy as though varnished; Mexico.....C. lucidum.
- 92a. Leaf-blades dull or subnitid, not appearing as though varnished.
93. Leaf-blades small, 3--9.1 cm. long, 1.5--5.4 cm. wide, obtusely rounded and emarginate or subcucullate at the apex; Mexico (introduced in Cuba)..C. ellipticum.
- 93a. Leaf-blades large, 3.5--29 cm. long, 1.1--11.3 cm. wide, acute or acuminate at the apex.
94. Petioles to 7 cm. long on mature leaves; Mexico....
C. jurgenseni.
- 94a. Petioles 0.6--2.5 cm. long on mature leaves.
95. Leaf-blades usually narrow, lanceolate or lanceo-

- late-oblong to narrowly elliptic.
96. Branchlets and twigs decidedly costate with numerous parallel longitudinal ridges; secondaries, tertiaries, and even the veinlets of much lesser rank all rather sharply prominulous above; leaf-blades dull.....C. hexangulare.
- 96a. Branchlets and twigs not costate; secondaries and tertiaries often merely rounded above; veinlets of lesser rank usually not prominulous above; leaf-blades shiny.
97. Mature leaf-blades subcoriaceous, with the veinlet-reticulation sharply prominulous beneath.....C. steyermarkii.
- 97a. Mature leaf-blades firmly chartaceous, with the veinlet-reticulation usually plane or even obscure beneath.....C. donnell-smithii.
- 95a. Leaf-blades usually broader, elliptic or elliptic-oblong to broadly oblong.
98. Leaf-blades light-green and shiny on both surfaces, not discoloring in drying; vein and veinlet reticulation sharply prominulous and conspicuous to the finest divisions above; racemes to 48 cm. long.....C. standleyi.
- 98a. Leaf-blades dark-green, usually dull, often discoloring in drying; vein and veinlet reticulation mostly only very slightly prominulous above, the ultimate divisions usually plane; racemes to 35 cm. long, usually much less.....C. spinosum.
- 91a. Veins and veinlets sparse, usually more or less obscure on both surfaces; secondaries often prominent.
99. Leaf-blades very blunt or only subacute at the apex.....C. caudatum.
- 99a. Leaf-blades distinctly acute or acuminate at the apex.
100. Leaf-blades bearing a pair of extremely large, prominent, and conspicuous heavy black glands to 4 mm. long at the base.....C. macradenium.
- 100a. Leaf-blades not glanduliferous at the base or with only small and inconspicuous glands.
101. Leaf-blades more or less ovate or broadly oblong-elliptic, mostly rounded at the base and but slightly prolonged into the petiole.....C. gleasonianum.
- 101a. Leaf-blades narrowly elliptic or oblong to lanceolate, acute or acuminate to cuneate at the base and more or less attenuate into the petiole.
102. Secondaries distinctly anastomosing near the margins.
103. Leaf-blades dull or subnitid above; secondaries not prominulous above; petioles slender, 13--20 mm. long.....C. glabrum.
- 103a. Leaf-blades very shiny and glossy above; secondaries very conspicuously prominulous above; petioles stout, 6--9 mm. long.....C. fulgidum.

- 102a. Secondaries not distinctly anastomosing near the margins, often obscure.
104. Petioles 2--4 mm. long.....C. ligustrinum.
- 104a. Petioles 7--20 mm. long.
105. Leaf-blades very shiny, especially above; petioles stoutish; Costa Rica and Panama.....
C. recurvatum.
- 105a. Leaf-blades dull, not shiny; petioles very slender; Mexico to Costa Rica....C. schottii.
- 90a. Native to South America.
106. Racemes 1--4.5 cm. long; petioles 2--5 mm. long; leaf-blades usually very small, usually sharp-toothed.....
C. ilicifolium.
- 106a. Racemes mostly 4.5--27 cm. long; petioles mostly 6--32 mm. long; leaf-blades much larger.
107. Vein and veinlet reticulation very prominent and conspicuous above.
108. Leaf-blades obovate or obovate-oblongate; petioles very short and indistinct; Colombia to Peru.....
C. reticulatum.
- 108a. Leaf-blades elliptic or oblong-oblongate; petioles distinct; northeastern South America.
109. Petioles 4--6 mm. long; leaf-blades not glanduliferous at the base; veinlet reticulation obscure beneath; western Venezuela.....C. mirifolium.
- 109a. Petioles 10--25 mm. long; leaf-blades with 1--3 pairs of small glands at the base; veinlet reticulation prominent and conspicuous to the last detail beneath; Trinidad and Tobago to Guiana and eastern Venezuela.....xC. hybridum.
- 107a. Vein and veinlet reticulation obscure, subimpressed, or impressed to merely prominent above.
110. Flowers sessile.
111. Petioles about 5 cm. long; Colombia.....C. vullense.
- 111a. Petioles 0.5--2.7 cm. long; not Colombian.
112. Peru and Bolivia; petioles 5--10 mm. long; leaf-blades not glanduliferous at the base; midrib sharply prominent above; rim of fruiting-calyx deeply lobed.....C. laurifolium.
- 112a. Brazil; petioles 10--27 mm. long; leaf-blades with a pair of glands (often very large and prominent) at the base; midrib plane or subimpressed above; rim of fruiting-calyx merely scarious.....
C. laetum.
- 110a. Flowers distinctly pedicellate.
113. Leaf-blades narrowly oblong to lanceolate or oblongate, gray-green; Brazil and Paraguay.C. rigidum.
- 113a. Leaf-blades broadly oblong, elliptic, or elliptic-oblong to ovate or subobovate; not Paraguayan.
114. Mature leaf-blades coriaceous.
115. Colombia; calyx about 4.5 mm. long and 4 mm.

- wide; corolla about 8.3 mm. long.....
C. sulcatum.
- 115a. Peru; calyx about 2.5 mm. long and 2
 mm. wide; corolla smaller.C. suberosum.
- 114a. Mature leaf-blades chartaceous.
116. Leaves normally ternate, with a pair of
 very large, crateriform, and very con-
 spicuous glands at the apex of the peti-
 ole.....C. macrophyllum.
- 116a. Leaves normally decussate-opposite;
 glands, if present, small and more or
 less inconspicuous.
117. Veinlet reticulation very abundant,
 prominulous above; leaf-blades glossy;
 Ecuador.....C. svensonii.
- 117a. Veinlet reticulation usually obscure
 or only very slightly prominulous a-
 bove; leaf-blades usually dull; not
 Ecuadorean.
118. Leaf-blades small, to 11.5 cm. long
 and 4 cm. wide; corolla-lobes dense-
 ly tomentose throughout within, in
 bud with the white tomentum project-
 ing and conspicuous where the lobes
 overlap.....C. subthyrsoidem.
- 118a. Leaf-blades usually large, to 29
 cm. long and 11.3 cm. wide; corolla
 lobes pubescent with brownish hairs
 only at the center and base within,
 no pubescence visible from the out-
 side of buds.....C. spinosum.
- 60a. Leaf-blades tomentose, velutinous, or pubescent to puberu-
 lent beneath.
119. Leaf-blades coriaceous or leathery-coriaceous, often very
 hard and stiff.
120. Petioles 3--4.5 cm. long.
121. Leaf-blades usually subtruncate at the base; Ecuador..
C. rimbachii.
- 121a. Leaf-blades usually acute at the base; Colombia.....
C. dryandrae.
- 120a. Petioles 0.4--1.1 cm. long.
122. South American; petioles glabrous, verruculose.....
C. krukovii.
- 122a. Central American and West Indian; petioles densely
 pubescent or furfuraceous, not verruculose.
123. Hispaniola; petioles 4--6 mm. long; leaf-blades 2--4
 cm. long; racemes 1--2 cm. long.....C. schulzii.
- 123a. Guatemala; petioles 6--10 mm. long; leaf-blades 4.2
 to 13 cm. long; racemes 7--10 cm. long.....
C. crassifolium.
- 119a. Leaf-blades membranous or merely chartaceous, often very

firmly so, but not leathery-coriaceous.

124. Flowers sessile or subsessile.

125. Leaf-blades very densely lanate-tomentose.

126. Rachis during anthesis extremely stout, about 4 mm. in diameter; calyx during anthesis extremely large, 5--6 mm. long and 4 mm. wide.

127. Inflorescence densely many-flowered...C. montanum.

127a. Inflorescence very loosely few-flowered.....
C. montanum var. chimbrazense.

126a. Rachis during anthesis more slender, to 2 mm. in diameter; calyx during anthesis smaller.

128. Leaf-blades glanduliferous beneath; tomentum mostly incanous.....C. kunthianum.

128a. Leaf-blades not glanduliferous; tomentum mostly flavescent.....C. subflavescens.

125a. Leaf-blades not densely lanate-tomentose.

129. Leaf-blades merely puberulent beneath or distichously short-pubescent only along the midrib..C. viride.

129a. Leaf-blades densely short-pubescent over the whole lower surface, especially on the venation.

130. Native to Mexico and Central America.

131. Midrib, secondaries, tertiaries, and veinlets more or less prominulous above; leaf-blades small, 4.7--7.5 cm. long, 1.9--2.6 cm. wide.....
C. integerrimum.

131a. Midrib and secondaries more or less impressed above; leaf-blades larger, 4.8--20 cm. long, 2.3--8 cm. wide.

132. Leaf-blades puberulent on the lamina beneath in addition to being short-pubescent on the venation.....C. cooperi.

132a. Leaf-blades merely short-pubescent beneath, not also puberulent on the lamina.

133. El Salvador; branchlets and twigs sharply tetragonal, densely puberulent; petioles, peduncles, and rachis densely puberulent....
C. teclense.

133a. Mexico; branchlets and twigs obtusely tetragonal, glabrate; petioles, peduncles, and rachis glabrate.....C. ambiguum.

130a. Native to South America (introduced in Africa).

134. Branchlets and twigs glabrous; petioles short and stoutish, 5--7 mm. long; Venezuela.....
C. venezuelense.

134a. Branchlets and twigs pubescent, hirtellous, or puberulent; petioles 7--35 mm. long.

135. Twigs densely tomentose.

136. Calyx during anthesis 4.5--5.5 mm. long, regularly 5-apiculate.....C. solanaceum.

136a. Calyx during anthesis about 8 mm. long, deeply 2-lipped.....

-C. solanaceum var. macrocalyx.
- 135a. Twigs merely pubescent or hirtellous to puberulent.
137. Calyx during anthesis 2--2.5 mm. long.
138. Leaf-blades oblong to ovate or ovate-elliptic, to 11.1 cm. long and 4.8 cm. wide.C. karsteni.
- 138a. Leaf-blades lanceolate or oblong-lanceolate, to 10.5 cm. long and 2.5 cm. wide.....C. karsteni var. lanceolatum.
- 137a. Calyx during anthesis 3--4.5 mm. long.
139. Nodes obscurely annulate; midrib, secondaries, tertiaries, and veinlet reticulation more or less prominulous above; leaf-blades very short puberulent above or merely punctate; Brazil...C. glaziovii.
- 139a. Nodes conspicuously annulate; midrib and secondaries often subimpressed above; vein and veinlet reticulation obscure above; leaf-blades scabrellous-strigillose above; Camercons.....C. solanaceum var. insolitum.
- 124a. Flowers distinctly pedicellate.
140. Leaf-blades distinctly scabrous above.....C. scabrum.
- 140a. Leaf-blades not scabrous above.
141. Racemes greatly abbreviated and few-flowered, usually 1-5-flowered.
142. Hispaniola; leaf-blades narrowly oblong or linear, to 6 mm. wide, mostly glabrate or but slightly hirtellous on the larger venation beneath.....C. microphyllum.
- 142a. Mexico; leaf-blades broader, oblong-elliptic or even subrotund, to 22 mm. wide, densely incanous-pubescent or villous to minutely puberulent beneath.
143. Petioles 1--2 mm. long; leaf-blades cuneate at the base and long-attenuate into the petiole.
144. Leaf-blades very densely incanous-pubescent beneath.....C. rosei.
- 144a. Leaf-blades only minutely and obscurely puberulent beneath.....C. rosei var. durangense.
- 143a. Petioles 3--14 mm. long; leaf-blades rounded or subacute at the base.....C. altamiranum.
- 141a. Racemes elongated, many-flowered.
145. Leaf-blades decidedly pubescent, hirtellous; villous, hirsute, or furfuraceous-tomentose to velutinous beneath.
146. Leaf-blades densely furfuraceous-tomentose with many-branched hairs.
147. Calyx during anthesis 2--2.5 mm. long and wide; corolla-limb glabrous or subglabrate on the outside; Mexico to Honduras.
148. Bractlets small, inconspicuous, about 2 mm. long.....C. mocinni.
- 148a. Bractlets elongate, linear or spatulate, 4--25

- mm. long.....C. mocinni var. longibracteolatum.
- 147a. Calyx during anthesis about 4 mm. long and 3.5 mm. wide; corolla-limb strigose-pubescent on the outside; El Salvador to Costa Rica.....C. lankesteri.
- 146a. Leaf-blades velutinous, villous, or hirtellous to pubescent or tomentose with simple hairs.
149. Leaf-blades densely appressed-hirsute beneath.....
C. hidalgense.
- 149a. Leaf-blades not hirsute.
150. Leaf-blades densely incanous-tomentose with curved or arched hairs beneath.....C. quitense.
- 150a. Leaf-blades variously villous, hirtellous, or pubescent, but not tomentose; hairs not arched.
151. Leaf-blades very firmly chartaceous when mature; vein and veinlet reticulation very prominent and conspicuous above.
152. Leaf-blades densely long-villous beneath.....
C. fruticosum var. villosum.
- 152a. Leaf-blades more or less sparsely short-villous or merely pubescent beneath, usually only along the midrib and in the axils of the secondaries.....
C. fruticosum var. subvillosum.
- 151a. Leaf-blades membranous or chartaceous, not especially firm; vein and veinlet reticulation not especially prominent or conspicuous above.
153. Native to South America.
154. Flowers pseudo-subsecund; racemes to 23 cm. long; Brazil.....C. pernambucense.
- 154a. Flowers not pseudo-subsecund; racemes 4-14 cm. long; Colombia and Venezuela.
155. Branchlets velutinous-pubescent; leaf-blades densely velutinous beneath, not falcate; rim of fruiting-calyx deeply 5-lobed.C. decorum.
- 155a. Branchlets glabrous; leaf-blades densely short-pubescent beneath, not at all velutinous, usually more or less falcate; rim of fruiting-calyx truncate or merely scarious.....C. dawei.
- 153a. Native to Mexico, Central America, or the West Indies.
156. Calyx during anthesis very densely pubescent.
157. Petioles densely pubescent or velutinous.....
C. berlandieri.
- 157a. Petioles densely or lightly pilose, not at all velutinous.....C. pentandrum.
- 156a. Calyx during anthesis lightly pubescent or merely puberulent.
158. Leaf-blades ovate or ovoid.
159. Branches very stout, wing-margined; leaf-blades usually densely velutinous-pubescent beneath, not incanous.....C. hintoni.
- 159a. Branches slender, not wing-margined; leaf-

- blades hirtellous-pubescent with incanous hairs beneath.....C. ovatifolium.
- 158a. Leaf-blades oblong or elliptic.
160. Leaf-blades nigrescent above in drying.....C. kerberi.
- 160a. Leaf-blades bright-green and not at all nigrescent above in drying.
161. Petioles 5--7 mm. long; leaf-blades finely hirtellous beneath; calyx-rim during anthesis deeply lobed; Guatemala to Panama..
C. hirtellum.
- 161a. Petioles 9--16 mm. long; leaf-blades densely short-pubescent or subvelutinous beneath; calyx-rim during anthesis subtruncate; Mexico.....C. bourgeauianum.
- 145a. Leaf-blades merely puberulent beneath, or, at least, not usually very densely nor conspicuously pubescent, or pubescent only on the larger venation.
162. Leaf-blades very firmly chartaceous; vein and veinlet reticulation very prominent and conspicuous above.
163. Leaf-blades always entire, mostly acute or short-acuminate at the apex, always puberulent or very short-pubescent beneath, often subvillous along the midrib and secondaries.....C. fruticosum var. subvillosum.
- 163a. Leaf-blades mostly undulate, sinuate, subserrate, or sharply serrate, rarely entire, mostly rounded at the apex, rarely villous-pubescent beneath.....
C. fruticosum var. subserratum.
- 162a. Leaf-blades merely chartaceous or membranous, not firm as above; vein and veinlet reticulation not as above.
164. Native to the West Indies.
165. Corolla 4--5 times as long as the calyx.....
C. longiflorum.
- 165a. Corolla 2--3 1/2 times as long as the calyx.
166. Leaf-blades very thin-membranous, very fragile, bicolored, very dark above in drying, very light beneath; vein and veinlet reticulation conspicuous beneath by its darker color, but not at all prominulous; racemes simple.....C. discolor.
- 166a. Leaf-blades chartaceous, not especially thin nor fragile, not bicolored, rather uniformly dark-green on both surfaces, nigrescent in drying; vein and veinlet reticulation mostly obscure; racemes mostly compound with 2 branches.....C. tristachyum.
- 164a. Not native to the West Indies.
167. Native to Mexico and Central America.
168. Midrib sharply prominulous above; secondaries, tertiaries, and veinlet reticulation decidedly prominulous above, giving the leaf a roughened aspect; tertiary veins more or less parallel with each other and running at right angles to the midrib; leaf-

- blades uniformly light-green on both surfaces.
C. hexangulare.
- 168a. Midrib plane or slightly impressed above; secondaries, tertiaries, and veinlets plane or obscure above, very irregular; leaf-blades not roughened above, very dark-green above, lighter beneath, mostly more or less nigrescent or brunneous in drying.
169. Leaf-blades decidedly puberulent beneath.
 170. Leaf-blades thin-membranous....C. sessaei.
 170a. Leaf-blades chartaceous.....
C. standleyi var. mexicanum.
- 169a. Leaf-blades subglabrous or only very sparsely scattered-pilosulous beneath.....
C. affine.
- 167a. Native to South America.
171. Leaf-blades very large, 16.5--25 cm. long, 7.5 to 12.3 cm. wide; racemes very numerous, often 2 from each axil, often compound.
172. Leaf-blades broadly elliptic, 10--12.3 cm. wide, short-pubescent but not lepidote beneath; racemes to 16 cm. long; peduncles to 2.6 cm. long; flowers rather large.....
C. poeppigii.
- 172a. Leaf-blades ovate or ovate-elliptic, 7.5--8.8 cm. wide, densely puberulent and lepidote beneath; racemes to 45 cm. long; peduncles to 7 cm. long; flowers smaller.....
C. poeppigii var. margaritaceum.
- 171a. Leaf-blades smaller, 2.5--16.7 cm. long, 1.5--7.2 cm. wide; racemes less numerous, one per leaf-axil, simple.
173. Leaf-blades chartaceous.
174. Petioles 1--2.1 cm. long; leaf-blades to 16.7 cm. long and 7 cm. wide; corolla-tube during anthesis about 15 mm. long; Brazil, Paraguay, and Argentina....C. myrianthum.
- 174a. Petioles 2--5 mm. long; leaf-blades to 5 cm. long and 2.2 cm. wide; corolla-tube during anthesis probably 1--3 mm. long; Peru.....C. kobuskianum.
- 173a. Leaf-blades thin-membranous.
175. Trinidad and Cedros; leaf-blades lanceolate or narrowly elliptic, 2.2--3.2 cm. wide; rachis densely puberulent or shortly canescent-pubescent.....
C. fruticosum var. brittonii.
- 175a. Ecuador and Peru; leaf-blades broadly elliptic, subobovate, or subrotund, 3.2--7.2 cm. wide; rachis obscurely puberulent or glabrate.....C. chartaceum.

1a. Fossil species.

176. From rock formations in the United States.

177. From the Lower Eocene of Mississippi; leaf-blades narrow elliptic, about 8 cm. long and 2.75 cm. wide; secondaries about 12 pairs.....C. eoligniticum.177a. From the Upper Eocene of Texas; leaf-blades broadly elliptic, about 6.5 cm. long and 3.25 cm. wide; secondaries about 7 pairs.....C. brazosense.

176a. From rock formations outside of the United States.

178. From the Oligocene of Italy.....C. forsithiaefolium.178a. From the Miocene of Colombia.....C. retiforme.

The Asplund 12692, tentatively determined as a member of this genus in the Stockholm herbarium, is not verbenaceous.

CITHAREXYLUM AFFINE D. Don, Edinb. New Phil. Journ. 11 (Jan.--Mar.): 238. 1831 [not Mart. & Gal., 1844].

Synonymy: Citharexylum affine D. Don ex Walp., Repert. 4: 75. 1845 [not Sessé & Moc., 1940]. Cytharexylum quadrangulare Sessé & Moc., La Naturaleza, ser. 2, 1: 103. 1889 [not Jacq., 1760]. Citharexylum quadrangulare Sessé & Moc., Fl. Mex., ed. 1, 152. 1894 [not L. 1786, nor Sessé & Moc., 1831, nor Hort. Madrit., 1845, nor Schau., 1864, nor Millsp., 1907, nor Boutelou, 1909, nor Griseb., 1909, nor Jacq., 1909, nor A. Rich., 1909, nor Hort., 1911]. Citharexylum emrickianum Greenm., Field Mus. Publ. Bot. 2: 187. 1907. Cytharexylum paztqarensense Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 24, in syn. 1940. Cytharexylum quadrangulare Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 24, in syn. 1940. Citharexylum quadrangulata Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 55, in syn. 1940. Citharexylum affinis D. Don ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941.

Literature: D. Don, Edinb. New Phil. Journ. 11 (Jan.--Mar.): 238. 1831; Walp., Repert. 4: 75. 1845; Schau. in A. DC., Prodr. 11: 611. 1847; Sessé & Moc., La Naturaleza, ser. 2, 1: 103. 1889; Sessé & Moc., Pl. Nou. Hisp., ed. 2, 96. 1893; Jacks., Ind. Kew. 1: 549. 1893; Sessé & Moc., Fl. Mex., ed. 1, 152. 1894; Sessé & Moc., Fl. Mex., ed. 2, 166. 1896; Greenm., Field Mus. Publ. Bot. 2: 187. 1907; Junell, Symb. Bot. Upsal. 4: 46 & 47. 1934; Moldenke, Alph. List Common Names 2, 7, 8, & 16. 1939; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 15, 24, & 55. 1940; Moldenke, Suppl. List Invalid Names 2. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Invalid Names 13--15 & 23. 1942; Moldenke, Phytologia 2: 95. 1944; Moldenke, Castanea 10: 43. 1945; Moldenke, Alph. List Cit. 1: 11, 35, 36, 122, 200, 202--204, 241, 242, 298, 299, 301, 304, 306, 308, 317, 319, & 322. 1946; Moldenke, Phytologia 2: 383. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 58. 1948; Moldenke, Alph. List Cit. 2: 327, 332, 337, 339, 342, 345, 393, 419, 420, 425, 426, 431, 436, 447, 459, 460, 498--502, 539--541, 571, 607, 631, 638, & 645 (1948), 3:

687, 694, 705, 729, 730, 750, 759, 768, 785, 788, 808, 830, 873, 886, 898, 904, & 926 (1949), and 4: 1022--1026, 1032, 1041, 1042, 1049, 1051, 1053, 1055, 1072, 1095, 1223, & 1235--1237. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 28, 157, & 178. 1949.

Shrub or spreading tree, to 10 m. tall; stems to 20 cm. in diameter; branches often quite stout, acutely tetragonal, very medullose, striate, glabrous; branchlets more slender, green, more or less acutely tetragonal or even 5-angled, sometimes alate-margined, medullose, glabrous; nodes very distinctly annulate; principal internodes 0.5--7 cm. long; leaf-scars very prominent, corky; leaves decussate-opposite; petioles slender, weak, 1--4 cm. long, glabrous, canaliculate and reddish above; leaf-blades thin-chartaceous or membranous, very dark-green above, lighter beneath, lanceolate-elliptic or ovate, 4--15.5 cm. long, 1.4--8.5 cm. wide, acute or very short-acuminate at the apex, entire, acute (or occasionally slightly prolonged into the petiole) at the base, usually glabrate on both surfaces, sometimes punctate or lightly puberulent beneath, usually not glanduliferous at the base, occasionally more or less hirsute-pubescent (especially on the petiole and midrib beneath) when very immature; midrib slender, prominent beneath, slightly impressed above; secondaries slender, 5--10 pairs, arcuate-ascending (or occasionally hardly arcuate), faintly anastomosing at the margins; veinlet reticulation very fine and delicate; racemes solitary, opposite, axillary or terminating short axillary several-racemed twigs, slender, 9--30 cm. long, 1--2 cm. wide, densely many-flowered; peduncles slender, 0.9--3 cm. long, glabrate; rachis slender or rather stout, glabrous or puberulent, striate; pedicels filiform, 1--2 mm. long, glabrous or puberulent, incrassate and elongate to 3 (or 6) mm. in fruit; prophylla setaceous, often reflexed; flowers numerous, 5--6 mm. long during anthesis, scented; calyx cyathiform or tubular-campanulate, membranous, about 3 mm. long, 5-veined, 5-angulate in cross-section, glabrous on the outside, pubescent within, the rim truncate, ciliate-pubescent, very shortly 5-denticulate; corolla about twice as long as the calyx, white or varying to blue, purple, lilac, or violet, the 2 upper lobes purple-striate, its tube slightly longer than the calyx, pubescent in the throat, otherwise glabrous, the lobes subtruncate; fruiting-calyx cupuliform, indurated, to 3.5 mm. long and 4.5 mm. wide, subtruncate or obsoletely 5-apiculate-toothed or shallowly 5-triangular-toothed, lightly puberulent or glabrate, the margin mostly short-pubescent and ciliate; fruit oblong or subglobose, varying from salmon or dull-orange to red or red-violet, turning black when ripe and in drying, shiny, 3--10 mm. long, 3--5 mm. wide, 2-lobed, apiculate at the apex, glabrous, always 2-seeded, much eaten by birds.

The type of this common species was collected by G. Andrieux (no. 135) at Chalco, in the state of México, Mexico, on May 14, 18-- (before 1832), and isotypes are widely distributed in leading herbaria. The type of C. emrickianum was collected by G. M. Emrick (no. 179) -- in whose honor it was named -- at the Haci-

enda Goahuayule, Michoacán, Mexico, in February, 1901, and is deposited in the herbarium of the Chicago Natural History Museum. It represents a form of the species with winged-margined branches and somewhat thicker leaf-blades, which often bear two indistinct glands at their base. It is thus intermediate between typical C. affine and typical C. pterocladum Donn. Sm., and ought perhaps rather to be included with the latter species.

The Citharexylum affine Mart. & Gal. referred to in the synonymy is actually C. hexangulare Greenm. The type of Cytherexylum quadrangulare Sessé & Moc. was collected by Martin Sessé, José Mariano Mociño, Castillo, and Maldonado (no. 2371) at Patzquari and Coahuayana, Michoacan, Mexico. They thought that the plant which they collected was the Citharexylum quadrangulare of Linnaeus, Syst. Veg. 472, and of Jacquin, Select. Stirp. Amer. 185--186, pl. 117 & 118 (1763). However, Cytherexylum quadrangulare Jacq., Citharexylum quadrangulare Jacq., C. quadrangulare Schau., C. quadrangulare L., and C. quadrangulare Hort. are all synonyms of C. spinosum L. On the other hand, Citharexylum quadrangulare Boutelou and C. quadrangulare Hort. Madrit. are C. pentandrum Vent., while C. quadrangulare Griseb. is C. fruticosum L., C. quadrangulare A. Rich. is C. caudatum L., and C. quadrangulare Millsp. is C. schottii Greenm.

Langlassé describes C. affine as a tree 8--10 m. tall, while other collectors designate it as a "bushy shrub" or as a "weak shrub". Pringle states that it attains a height of from 15 to 20 feet. It inhabits open valley lands and hillslopes above rivers, pine woods, and pine-oak forests, and ascends from 15 meters altitude in Sinaloa and Nayarit to 2900 meters in the state of México. Morton and Makrinus describe the species as a "shrub with green, angled, and winged branchlets; petioles channeled and reddish above; corolla lilac, the 2 upper lobes purple-striate, coll. at alt. of 400--650 m.", while on the Washington specimen they say "branchlets 5-angled". It has been collected in anthesis in January, February, and from April to November, and in fruit in February and from April to November. The fruits are extensively fed upon by birds and are also eaten by children because of their sweet flesh. Kerber reports that the leaves are used in applications against swellings. The flowers have been variously described as lavender or bluish, or, by some, as pink with a white throat. Among its vernacular names reported are "alacate", "cacachila", "canutillo", "chachalaca", and "jalacate". Gerth van Wijk records "savanna wattle" as possibly applying to "C. quadrangulare Moc. et Sessé." Cooper says that it "would be suitable for a screen or low wind break" in Kenya. The Howell 8505, cited below, is inscribed "Cultivated?"

The stout (often hollow), striate, glabrous, acutely angled branches, conspicuously annulate nodes, and prominent leaf-scars are characteristic. The racemes are often pendent and then the pedicels become reflexed so that the flowers and fruits still

point upwards. The annulations at the nodes are often extremely conspicuous. The typical shape of the mature fruits is oblong; subglobose ones are doubtless immature. Occasionally specimens will be found (e.g., Lamb 429 in the Missouri Botanical Garden herbarium) with the smaller leaves obtuse at the apex. The larger leaves, however, are typically acute or shortly acuminate. On some specimens, notably Edw. Palmer 94 at Copenhagen, the branches are not only very sharply 4-angled, but are 4-winged as well. Lamb 429 and 610 were erroneously distributed originally under the name of Duranta plumieri Jacq. Lamb 610 in some herbaria is mixed with Pisonia aculeata L. Lamb 610 and Nelson 4311 at the Gray Herbarium were compared by Casimir de Candolle with the isotype of C. affine in the DeCandolle Herbarium at Geneva and were determined by him as this species. Pringle 6647 is rather anomalous in having its younger parts -- twigs, petioles, and leaf-blades (especially the larger venation beneath) -- hirsute-pubescent, but this pubescence is apparently soon lost as the parts mature. The entire plant, however, retains a more or less pulverulent-pulverulent aspect not seen on typical material of this species. Rose, Standley, & Russell 14343 at the New York Botanical Garden also exhibits this grayish-pulverulent aspect throughout.

The Langlassé 210 collection cited below as from Guerrero may actually have come from Michoacán instead, since its labels are merely inscribed "Delta de las Balsas". Gonzales Ortega 86 is inscribed "San Ignacio, Agua Caliente": I am assuming that this was from the state of Aguascalientes.

It is perhaps worth noting that Sessé & Moçino originally published the name of their plant as "Cytharexylum quadrangulare" in 1889 and wrote it that way also in their Pl. Nou. Hisp., ed. 2, 96 (1893). In 1894 they corrected it to "Citharexylum quadrangulare" in edition 1 of their Fl. Mex., p. 152, and maintained the corrected form in edition 2, p. 166 (1896) of this work.

The gynoecium morphology of the species is discussed by Junell in the reference cited above, where he notes a striking resemblance to that of Baillonia amabilis Bocq. In all, 170 herbarium specimens, including the type collections of all the names involved, and 26 mounted photographs have been examined.

Citations: MEXICO: Aguascalientes: J. Gonzales Ortega 86 (Me). Colima: Kerber 169 (B); Edw. Palmer 94 (Cp, Fs, L, Mi, N--photo, S, W--398847, Z--photo), 1326 (A, B, Bm, Cb, Cb, F--185316, G, K, L, N, Ut, W--208876). Guerrero: J. T. Howell 8505 (Gg--272144); Langlassé 210 (B, Cb, Cb, G, K, N, P, W--385784); Lemmon & Lemmon 346 (Ca--153928). Jalisco: Beechey s.n. (K). Maria Madre Island: E. W. Nelson 4311 (Cb, F--600610, G, W--346055). México: Andrieux 135 [Macbride photos 7877] (B--photo of isotype, B--photo of isotype, Dc--isotype, F--645687--photo of isotype, K--isotype, K--isotype, Kr--photo of isotype, Mu--746--isotype, N--photo of isotype, N--photo of isotype, P--isotype, S--photo of isotype, V--isotype, Z--photo of isotype); Beauchamp s.n. [Amecameca] (E--

933652, La); G. L. Fisher 281 (W--1207680), 283 (W--1207681), s.n. [Amecameca, July 24, 1924] (E--912893, F--554810, Hp); Hinton 317 (K, Me), 2042 (K, N), 2367 (F--879159, K, N), 9011 (Au, N); Matuda 32243 (Ss); Matuda & al. 28276 (Ss), 30899 (Z); Pringle 6647 (A, B, Bm, Br, Ca--104979, Cb, Cm, D, E--119121, Ed, F--50232, G, Io--38740, J, K, L, Me, Me, Me, Mi, Mu--3707, N, N--photo, P, S, V--2807, Vt, Vu, W--316879, X, Z--photo); Rutten & Rutten-Pekelharing 790 (Ut). Michoacán: Emrick 179 (B--photo, F--19580--photo, F--95639, K--photo, K--photo, N--photo, S--photo, Z--photo); Sessé, Mociffo, Castillo, & Maldonado 2371 [Macbride photos 30833] (F--851475, F--929217--photo, N--photo, Q, Z--photo, Z--photo), 2372 (F--849476, Q). Nayarit: Ferris 5806 (A, Du--193992, W--1491659); J. Gonzales Ortega 59 (Me), 93 (W--1169227); J. Gregg 917 (E--119045, E--119113), s.n. [1848--1849] (E--119046); Lamb 610, in part (Cb, Du--9530, G); Maltby 37 (W--314789); Mexia 518 (B, Cp, Du--175394, La, W--1317815), 584 (A, Bm, Ca--349668, Cb, E--957554, F--689290, Gg--155862, Mi, N, W--1317818); F. W. Pennell 19948 (D--773321, W--1642124); J. N. Rose 1436 (W--300262), 1439 (F--216150, W--300270); Rose, Standley, & Russell 14182 (G, W--637039), 14343 (N, W--637212); Viereck 1188 (B). Oaxaca: Morton & Makrinius 2300 (F--823562, K, W--1585341); Reko 4058 (W--1012235). Sinaloa: J. Gonzales Ortega 343 (K), 4209 (W--1038498), 5430 (A, Ca--406443, K, Me, Me, N--photo, W--1207528, Z--photo), 5874 (W--1209626), 6438 (B, D--650884, Du--170401, G, Mu, W--1269675); Lamb 429 (Du--9519, E--119001, F--160382, N, W--275349); Nervaez Montes & Salazar 343 (W--1035242); Rose, Standley, & Russell 14785 (F--531497, G, P, W--637666). State undetermined: Andrieux 115 (Cb); Herb. Pavon s.n. [Pathguarem] (X); W. Schaffner 487 (B, B); Schnee s.n. (N, P, P, P). CULTIVATED: Kenya: A. M. Cooper H.63/44 (N).

CITHAREXYLUM AFFINE var. GLANDULIFERUM Moldenke, Geogr. Distrib.

Avicenn. 13, nom. nud. (1939), Phytologia 1: 412--413. 1940.

Literature: Moldenke, Geogr. Distrib. Avicenn. 13. 1939;

Moldenke, Phytologia 1: 412--413. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 2: 541. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 28 & 179. 1949.

This variety differs from the typical form of the species in its broadly ovate leaf-blades, which are to 12 cm. long and 6.5 cm. wide, irregularly sharp-dentate along the margins when mature, puberulent throughout on the lower surface, and glanduliferous with several brown disk-like glands along the midrib and at the base beneath. The sharply tetragonal and glabrous branches, branchlets, and twigs are many-striate and abundantly impressed glandular-punctate (!).

The type of the variety was collected by George B. Hinton (no. 7344) in oak woods at Yperricones, Temascaltepec, in the

state of México, Mexico, on February 7, 1935, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The collector states that the plant was 3 m. tall. The glands on the lower leaf-surface of this variety are discoid, like those seen in many species of Aegiphila Jacq., and not elongate as in most other members of the genus Citharexylum. Two herbarium specimens have been examined.

Citations: MEXICO: México: Hinton 7344 (K--type, N--isotype).

CITHAREXYLUM ALBICAULE Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 208. 1863.

Synonymy: Citharexylum albicaule Turcz. ex León & Alain, Fl. Cuba 4: 299 & 350. 1957.

Literature: Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 208. 1863; Jacks., Ind. Kew. 1: 549. 1893; O. E. Schulz in Urb., Symb. Ant. 6: 56 & 60. 1909; Moldenke, Geogr. Distrib. Avicenn. 5. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 24 & 88. 1942; Moldenke, Alph. List Cit. 2: 349 (1948) and 3: 889. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 43 & 179. 1949; Moldenke, Rev. Sudam. Bot. 8: 172. 1950; Alain in León & Alain, Fl. Cuba 4: 299. 1957.

Shrub or tree; branches and branchlets medium-stout, white or very light-gray, acutely or obtusely tetragonal, rather obscurely striate, glabrous; young shoots slender, tetragonal or subterete, striate, becoming black in drying, glabrous; nodes annulate, often only obscurely so; leaf-scars elevated 1--5 mm. on very prominent and corky sterigmata; principal internodes 1.5--5 cm. long; leaves decussate-opposite (or approximate on young shoots); petioles slender, often nigrescent in drying, 5--17 mm. long, glabrate; leaf-blades chartaceous and nigrescent in drying when immature, subcoriaceous and not nigrescent in drying when mature, uniformly colored on both surfaces and subnitid when mature, narrowly elliptic or oblanceolate, 4.5--9.2 cm. long, 1.3--3.1 cm. wide, acute or obtuse at the apex, entire, often very slightly revolute in drying, cuneately attenuate to the 2-glandular base, glabrous on both surfaces; midrib slender, prominent beneath, prominent above; secondaries slender, 3--5 pairs, arcuate-ascending, rather obscurely anastomosing at the margins with the veinlet reticulation prominulous on both surfaces; racemes spiciform, 6--10 cm. long, 1 cm. or less wide, many-flowered, terminal and terminating short axillary shoots; peduncles slender, abbreviated, 5--12 mm. long, glabrous; rachis slender, glabrous, often blackish in drying; pedicels obsolete or to 0.8 mm. long; prophylla setaceous, minute; flowers erect-spreading; calyx cyathiform, about 3 mm. long, glabrous outside, the rim plainly 4- or 5-dentate, slightly ciliolate, the teeth unequal, about 1 mm. long, often connate in pairs; corolla in bud subhypanocrateriform, about 5 mm. long, not quite twice as long as the calyx, glabrous outside, villous in the throat, otherwise glabrous within, the lobes suborbicular, glabrous, about 1/3 the length of the tube; stamens 4, the fifth one rudimentary; filaments very short; anthers longer than the filaments; mature

flowers, fruiting-calyx, and fruit not known.

The type of this species was collected by Ramón de la Sagra (no. 213) somewhere in Cuba. The type collection has been variously identified as "Duranta sp.", "Citharexylum coriaceum ?", and "aff. C. quadrangulare". Although Turczaninow does not cite any number in his original description, Sagra's no. 213 is doubtless the collection on which the species was based, and the type is probably deposited in the herbarium at Kiev, where the non-Siberian portion of Turczaninow's herbarium is preserved. An unnumbered Sagra collection, at first thought to be the one which Turczaninow had before him, has proved to be C. fruticosum var. subvillosum Moldenke.

The present species is remarkable because of its deeply lobed calyx. Its white branches and branchlets are also striking, but similar ones are seen in forms of C. fruticosum L. The differences in the leaf-blade venation mentioned by Schulz and the differences in the color of the branches as emphasized by Turczaninow are not very workable characters for a key. The fact that the young shoots and immature leaves blacken in drying is striking, and, taken in connection with the white branches and branchlets, offers a striking contrast in color on dried specimens. The glands on the leaf-base are oblong and sunken, not prominent. Schulz differentiates it from C. fruticosum in this way: Lateral veins of the leaf-blades prominent beneath; calyx plainly dentate; branchlets obtusely tetragonal...C. albicaule. Lateral veins of the leaf-blades prominent on both surfaces; calyx very shortly dentate; branchlets acutely tetragonal...C. fruticosum. Alain differentiates them in essentially the same manner.

In all, 8 herbarium specimens and 6 mounted photographs and drawings have been examined.

Citations: CUBA: Province undetermined: Sagra 213 (B--isotype, B--photo of isotype, B--drawing of isotype, F--998436--isotype, K--photo of isotype, N--isotype, N--isotype, N--photo of isotype, P--isotype, S--photo of isotype, V--isotype, X--isotype, Z--photo of isotype). CULTIVATED: Cuba: Acuffa 15584 (Es).

CITHAREXYLUM ALTAMIRANUM Greenm., Field Columb. Mus. Publ. Bot. 2: 259. 1907.

Literature: Greenm., Field Columb. Mus. Publ. Bot. 2: 259. 1907; Prain, Ind. Kew. Suppl. 4: 49. 1913; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 1: 307. 1946; Moldenke, Phytologia 2: 330. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 48. 1948; Moldenke, Alph. List Cit. 2: 423 (1948), 3: 679 & 872 (1949), and 4: 1028, 1031, & 1164. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 28 & 179. 1949.

Shrub, to 2 m. tall; branches stout, gray, the bark rough; branchlets short, stout, stiff, acutely tetragonal or obtusely so in age, gray, glabrate, the ultimate ones and young shoots very short, mostly clustered, brown or brownish, hexangular, densely villous-pubescent or short-hirsute with brownish or can-

escent hairs; principal internodes greatly abbreviated, to 15 mm. long; leaves decussate-opposite, usually more or less clustered on greatly abbreviated shoots; petioles very slender, 3--14 mm. long, rather densely villous or pubescent; leaf-blades chartaceous, somewhat darker above than beneath, oblong-elliptic or subrotund, varying to ovate or ovate-oblong, 0.8--4 cm. long, 0.5--2.5 cm. wide, rounded or obtuse to subacute (rarely emarginate) at the apex, entire or sometimes very irregularly and bluntly toothed or lobed with 1--few very short lobes, rounded or subacute but not glanduliferous at the base, densely villous-pubescent or hirsute-pubescent with short canescent hairs on both surfaces, especially on the larger venation beneath, ciliate along the margins, usually bearing 1--3 disklike glands on the blade; midrib very slender, prominulous beneath, slightly impressed above; secondaries very slender, very few and irregular, often hardly reaching the margins, impressed above; veinlet reticulation very delicate; racemes much abbreviated, spiciform, 1--3 cm. long, 1--4-flowered, terminal, simple, pubescent; peduncles very short, 2--6 mm. long, very slender, weak, villous; rachis very slender, weak, villous; pedicels filiform, about 1 mm. long, villous; prophylla linear, 1--3 mm. long, surpassing the pedicels, villous; flowers not seen; fruiting-calyx campanulate or turbinate to cupuliform, 4--4.5 mm. long, about 6 mm. wide, light, chartaceous, 5-costate or 5-angulate-keeled at the base, each rib ending in a mucronate tooth projecting about 1 mm. above the otherwise subtruncate rim (the teeth erect, acute), slightly pubescent on both surfaces, ciliate on the rim; fruit oblong or oblong-elliptic to subglobose, dark reddish-purple, 6--8 mm. long, 4--5 mm. wide, glabrous, shiny, 2-lobed, 2-seeded; seeds elliptic, 6--7 mm. long, concavo-convex, smooth.

The type of this species was collected by Fernando Altamirano (no. 1566) -- in whose honor it is named -- at the Hacienda del Ciervo, between Del Ciervo and the "mountain of the mesa", Querétaro, Mexico, on August 20, 1905, and is deposited in the United States National Herbarium at Washington. The unnumbered Altamirano specimen cited below is probably part of the type collection. It was collected at the type locality on the same date also by Rose, Painter, & Rose. The species is most distinct; it inhabits mountainous areas, and has been collected only in fruit in August and October. It has the general appearance of C. berlandieri B. L. Robinson, but differs in having smaller leaves, fewer-flowered inflorescences, and in the calyx characters. In all, 10 herbarium specimens, including the type, and 14 mounted photographs have been examined.

Citations: MEXICO: Hidalgo: C. L. Lundell 12558 (Ld). Querétaro: Altamirano 1566 (B--photo of type, F--195704--isotype, F--195704--photo of type, K--photo of type, K--photo of type, N--photo of type, S--photo of type, W--570648--type, Z--photo of type), s.n. [Agosto 20, 1905] (Me); Rose, Painter, & Rose 9666 (E--715105--photo, F--195706, F--195706--photo, W--453156), 10268 (E--717426--photo, F--195708, F--195708--photo, K--photo, N, N,

N--photo, W--453770, Z--photo).

CITHAREXYLUM AMAZONICUM Moldenke in Fedde, Repert. Sp. Nov. 37: 216. 1934.

Synonymy: Cytharexylum cinereum L. ex Le Cointe, A Amaz. Brasil. III Arv. & Plant. Uteis 349. 1934 [not Cytharexylum cinereum L., 1851, nor Spreng., 1851, nor Cytharexylum cinereum L., 1763, nor Sessé & Moc., 1894, nor Donn. Sm., 1907, nor Jacq., 1909].

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 216. 1934; Le Cointe, A Amaz. Brasil. III Arv. & Pl. Uteis 349. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 25. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 36 & 88. 1942; Moldenke, Alph. List Cit. 2: 347 & 448. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Moldenke, Alph. List Cit. 3: 695 & 955. 1949.

Shrub; branches and branchlets extremely stout, hollow, obtusely 6-angled or subterete, glabrous; nodes rather inconspicuously annulate; leaf-scars large, vertically elongate, not greatly elevated; principal internodes 10--11 cm. long; leaves ternate, very large; petioles comparatively slender, 5--6.5 cm. long, glabrous; leaf-blades thin-chartaceous or membranous, very dark-green and shiny above, much lighter beneath, broadly elliptic, 15--29 cm. long, 7--14.8 cm. wide, broadly short-acuminate at the apex, entire, broadly acute or short-acuminate at the base, with two large elongated lateral glands at the very base, glabrous on both surfaces; midrib rather stout, prominent beneath, prominent in a very narrow line above; secondaries slender, 7--9 pairs, beautifully arcuate-ascending, prominent beneath, plainly anastomosing at the margins; veinlet reticulation fine, beautifully conspicuous beneath; racemes axillary and terminal, spiciform, often 2 or 3 from a single axil, 4.5--10 cm. long, about 1 cm. wide, many-flowered, the terminal one on the main branches usually compound with about 4 whorls, each subtended by 2 small bracts, the axillary ones often bearing 1 or 2 short branches at the base of the floriferous portion, subtended by a pair of small bracts; axillary peduncles slender, terminal one stout, 6.5--9.8 cm. long, glabrous or minutely puberulent toward the apex; rachis slender (or the terminal one stout), puberulent or subglabrate; pedicels slender, about 1 mm. long or less, puberulent; bracts linear, 7--11 mm. long, usually upwardly arcuate, puberulent; prophylla minute, setaceous, 1 mm. long or less, puberulent; calyx tubular-obconic, about 4.1 mm. long and 2.1 mm. wide, glabrate, lightly 5-ribbed, its rim truncate and entire; corolla-tube (in bud) about 4.5 mm. long, glabrous outside, the lobes 5; stamens 4, included, equal, not didynamous in bud; anthers oblong, about 1.3 mm. long and 0.3 mm. wide; pistil included; style stoutish, about 2.1 mm. long, glabrous; stigma very shortly 2-lobed, the lobes about 0.5 mm. long and not fimbriate; ovary oblong, about 1 mm. long and 0.8 mm. in diameter, 4-celled; fruiting-calyx and fruit not seen.

The type of this species was collected by Richard Spruce (no. 2114) near San Gabriel da Cachoeira, on the Rio Negro, Amazonas,

Brazil, between January and August, 1852, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is closely related to C. poeppigii Walp. and has hitherto been confused with C. cinereum L. The floral characters given above will probably have to be modified when specimens in full anthesis are available. Nine herbarium specimens and 10 mounted photographs have been examined. Le Cointe records the vernacular names "pão de guitarro", "pão de viola", and "pombeira".

Citations: BRAZIL: Amazonas: Spruce 2114 [Macbride photos 34318] (B--isotype, B--photo of type, Bm--isotype, Bm--isotype, Br--isotype, F--976290--photo of isotype, K--isotype, K--isotype, K--isotype, Kr--photo of type, N--type, N--photo of type, N--photo of isotype, N--photo of isotype, S--photo of type, V--285037--isotype, Z--photo of type, Z--photo of isotype).

CITHAREXYLUM AMBIGUUM Moldenke in Fedde, Repert. Sp. Nov. 37: 216. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 216. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 1: 118. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 28 & 179. 1949.

Tree or shrub; branchlets medium-stout, gray, obtusely tetragonal, glabrate; nodes apparently not annulate; principal internodes 2--3.3 cm. long; leaf-scars borne on short, ascending, closely appressed, corky sterigmata; leaves decussate-opposite, often unequally paired; petioles rather stout, 0.5--1 cm. long, flattened above, glabrate; leaf-blades firmly chartaceous, gray-green on both surfaces, dull, obovate-elliptic, 5.2--16.5 cm. long, 2.5--5.7 cm. wide, rounded or subacute at the apex, entire, cuneate at the base, slightly scabrelous above, densely short-pubescent beneath, bearing a pair of elongate glands at the very base; midrib stout, deeply impressed above, prominent beneath; secondaries slender, numerous, close, 8--11 pairs, ascending at an angle of about 45° , arcuate only at their apex, rather indistinctly anastomosing at the margins, impressed above, prominulous beneath; vein and veinlet reticulation fine, impressed above, prominulous beneath; racemes terminal, erect or nutant, about 8 cm. long, about 2 cm. wide (or wider) in fruit, rather few-flowered, simple; peduncles stout, about 2.2 cm. long, gray, glabrate, with a single node near the middle; rachis stout, glabrate; pedicels obsolete, the fruits borne on greatly incrassate and gnarled sterigma-like projections; bracts, bractlets, prophylla, and flowers not seen; fruiting-calyx very large and incrassate, shallowly cupuliform or patelliform, about 4.5 mm. long and 10 mm. wide, very minutely puberulent on both surfaces, its rim irregularly erose; fruit extremely large, ovoid, about 1.9 cm. long and 1.6 cm. wide, fleshy, nigrescent and flattened in drying, 2-sulcate, 2-seeded, shiny.

The type of this species was collected somewhere in Mexico, the specimen being inscribed merely as follows: "Ex herb. Mus. Paris (No label). (Rec. 4/74)" and annotated first as "Cordia

sp.", then "Verbenaceae", then "Citharexylum", and finally "Cf. Citharexylum Bourgeauianum Greenm." It has the largest fruit known to me in the genus and seems to be very closely related to C. teclense Standl. Only the type specimen and 4 mounted photographs have been examined.

Citations: MEXICO: State undetermined: Ex herb. Mus. Paris s. n. ["No label, rec'd. 4/74ⁿ"] (B--photo of type, K--type, N--photo of type, S--photo of type, Z--photo of type).

CITHAREXYLUM ANDINUM Moldenke in Fedde, Repert. Sp. Nov. 37: 217-218. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 217-218. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 28. 1939; Moldenke, Lilloa 8: 414. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 40 & 88. 1942; Moldenke, Pl. Life 2: 44. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 96 & 179. 1949; Moldenke, Alph. List Cit. 3: 694, 705, 706, & 968. 1949; Moldenke, Phytologia 3: 305 (1950) and 4: 187-188. 1953.

Shrub, to 1.5 m. tall; branches, branchlets, and twigs slender, often more or less flexuous or wand-like, stramineous, sharply tetragonal, glabrous, shiny, spinose, the younger ones often 4-margined, lenticellate; twigs not noticeably nor consistently abbreviated; nodes plainly annulate; principal internodes 1--5.5 cm. long; spines slender, 6--16 mm. long, with 3 sterigma-like scars in a whorl near the apex, very sharp, not very stout; leaf-scars borne on large, divergent, very corky sterigmata about 3 mm. long; leaves decussate-opposite; petioles very slender, 3--6 mm. long, glabrous; leaf-blades subchartaceous, dark-green, often subbrunneous in drying, slightly lighter beneath, oblong or elliptic, 0.8--2.8 cm. long, 5--13 mm. wide, rounded or subemarginate at the apex, entire, acute at the base, not glanduliferous, glabrate on both surfaces; midrib very slender, subimpressed above, very slightly prominulous beneath; secondaries very slender, 4 or 5 pairs, arcuate-ascending, subimpressed or obscure above, hardly prominulous beneath; vein and veinlet reticulation obscure or indiscernible on both surfaces; racemes abbreviated, to 1 cm. long, 2--4-flowered, axillary, numerous; peduncles very slender, 1--4 mm. long, glabrate; rachis obsolete; pedicels very slender, 1--3 mm. long, pulverulent or glabrate; bracts and bractlets none; prophylla minute, not obvious; calyx tubular, slightly zygomorphic, about 3.3 mm. long and 2 mm. wide, glabrate, distinctly 5-ribbed, its margin very shortly apiculate-dentate with 5-teeth; corolla white, hypocrateriform, its tube suberect, about 3.6 mm. long and 1.8 mm. wide, glabrous outside, densely tomentose in the throat within, its lobes 5, oblong-lingulate, about 2 mm. long and 1.5 mm. wide, rounded at the apex; stamens 4, subequal, inserted about 1 mm. below the mouth of the corolla-tube, included; filaments obsolete; anthers oblong, about 0.7 mm. long and 0.3 mm. wide; pistil included;

style stoutish, about 1.4 mm. long, glabrous; stigma very shortly 2-lobed; ovary oblong, about 1 mm. long and wide, glabrous; fruiting-calyx light, subherbaceous, cupuliform, about 3 mm. long and 5 mm. wide, minutely puberulent or glabrate, its rim subtruncate or shallowly 5-lobed or -angled with 5 slightly thickened ridges; fruit subglobose, about 8 mm. long and wide, fleshy, glabrous, black and wrinkled in drying, deeply 2-sulcate.

The type of this distinct species was collected by Gilbert Mandon (no. 1493) in thickets at Juninapi, in the vicinity of Sorata, in the valley of Challasuyo, at an altitude of 2700 meters, in the Bolivian Andes, between October, 1877, and April, 1878, and is deposited in the herbarium of the Naturhistorisches Museum at Vienna. It is closely related to C. weberbaueri Hayek and to C. flexuosum (Ruiz & Pav.) D. Don, with the former of which it has hitherto been confused. It has also been mis-identified as Duranta plumieri Jacq. It does not have the short twigs covered by almost overlapping sterigmata, nor the greatly abbreviated internodes, nor the pubescence of C. weberbaueri, from which it also differs in its stramineous, acutely tetragonal, often margined, plainly annulate branches, branchlets, and twigs, its more slender and flexuous habit, and its geographic range. It has been collected at altitudes of 2500 to 3000 meters, definitely in anthesis in November. Seventeen herbarium specimens, including the type, and 8 mounted photographs have been examined.

Citations: PERU: Cajamarca: Scolnik 1302 (N). BOLIVIA: Cochabamba: Steinbach 3889 [Herb. Inst. Miguel Lillo 35117] (N). La Paz: Günther 5863 (W--1133303); Mandon 133 (S), 1493 [Macbride photos 28393] (B--photo of type, Bm--isotype, Cb--isotype, Cb--isotype, F--830274--photo of isotype, G--isotype, K--isotype, K--photo of type, Kr--photo of isotype, L--isotype, N--isotype, N--photo of type, N--photo of isotype, P--isotype, S--isotype, S--photo of type, V--type, X--isotype, Z--photo of type), Santa Cruz: Steinbach 8572 (E--989595, N, S).

CITHAREXYLUM ARGUTEDENTATUM Moldenke in Fedde, Repert. Sp. Nov. 37: 218. 1934.

Synonymy: Citharexylum argentidentatum Moldenke ex Goodspeed & Stork, Univ. Calif. Publ. Bot. 28: 117, sphalm. 1955.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 218. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 23. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 88. 1942; Moldenke, Alph. List Cit. 122. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 43--44. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71 & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Moldenke, Alph. List Cit. 3: 728 (1949) and 4: 1032, 1035, 1079, & 1211. 1949; Goodspeed & Stork, Univ. Calif. Publ. Bot. 28: 117. 1955.

Shrub, to 1 m. tall; branches and branchlets short, very twiggy, slender, tough, subterete but striate, very finely furfuraceous-puberulent with fuscous hairs, becoming glabrate in age; leaf-scars borne on incrassate sterigmata 1--2 mm. long and wider

at their apex than the (dried) petiole-base; nodes very obscurely annulate; petioles 1--2 mm. long and winged by a prolongation of the leaf-blade, or obsolete; leaves decussate-opposite; leaf-blades coriaceous, lighter beneath, very shiny on both surfaces, rotund or somewhat elliptic in outline, 1.2--1.9 cm. long, 0.9--1.8 cm. wide, sharply and strongly dentate along the margins to below the middle in the manner of *Ilex opaca* Ait., with teeth very divergent, often recurved, and with slightly revolute margins, abruptly attenuate at the base and prolonged into the short winged petiole, glabrous on both surfaces, glandular-punctate beneath; midrib comparatively stout, flat above, prominent beneath; secondaries slender, 3 or 4 pairs, prominulous beneath, furcate near the margins, usually not anastomosing; veinlet reticulation sparse, obscure; racemes terminating the short branchlets, greatly abbreviated, reduced to 1, 2, or 3 flowers, when 1-flowered appearing to be axillary in the uppermost leaf-axils; flowers not seen; fruting-calyx campanulate, 3--4 mm. long and wide, glabrous, shiny, its rim rather deeply 4- or 5-toothed or -lobed; fruit subglobose or oblong, 3--4 mm. long and wide (immature?), very firm, deep-purple when fresh, black in drying, glabrous, shiny, apiculate at the apex.

The type of this apparently rare species was collected by Orator Fuller Cook and G. B. Gilbert (no. 745) at Ollantaytambo, altitude about 3000 meters, Cuzco, Peru, on May 15, 1915, and is deposited in the Britton Herbarium at the New York Botanical Garden. Its very thick-coriaceous, waxy-nitid, holly-like leaves characterize this species and indicate its relationship to *C. ilicifolium* H.B.K. The greatly reduced inflorescences are remarkable. It has been found on dry open hillsides in rocky soil at altitudes of 3000 to 3620 meters. It has been confused with *C. pachyphyllum* Moldenke by Killip and specimens have been distributed as "*Ilex* sp." in some herbaria. The vernacular names "tasta" and "tosta" have been recorded. It has been collected thus far only in May and it is hoped that specimens in anthesis may soon be available. Five herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: PERU: Cuzco: Cook & Gilbert 719 [photo 343] (W--603906), 745 (B--photo of type, K--photo of type, N--type, N--photo of type, S--photo of type, W--603930--isotype, Z--photo of type), 1865 (W--703602). Puno: R. D. Metcalf 30464 (W--1875904).

CITHAREXYLUM BERLANDIERI B. L. Robinson, Proc. Amer. Acad. 26: 174. 1891.

Synonymy: *Citharexylum tomentosum* var. *molle* Regel ex Moldenke, Prelim. Alph. List Invalid Names 18, in syn. 1940 [not *C. molle* H.B.K., 1818, nor Salisb., 1796, nor Jacq., 1825, nor Hook., 1940]. *Citharexylon berlandieri* Rob. ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941.

Literature: B. L. Robinson, Proc., Amer. Acad. 26: 174. 1891; Coulter, Contrib. U. S. Nat. Herb. 2: 330. 1894; Grey & Hubbard, List Pl. Bot. Gard. Atkins Inst. 56. 1933; Cory, Texas Agr. Exp.

Sta. Bull. 550: 88. 1937; Moldenke, Geogr. Distrib. Avicenn. 4 & 13. 1939; Moldenke, Alph. List Common Names 22. 1939; Moldenke, Prelim. Alph. List Invalid Names 18. 1940; Moldenke, Suppl. List Invalid Names 2. 1941; Moldenke, Alph. List Invalid Names 13 & 15. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 12, 16, 71, & 88. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 73--74. 1942; Moldenke, Phytologia 2: 95 & 124 (1944) and 155. 1946; Moldenke, Alph. List Cit. 1: 32, 38, 104, 111, 114, 126, 130, 192, 199, 200, 202, 210, 299, 301, 305, 306, 309, 311, & 314. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 50. 1948; Moldenke, Wrightia 1: 244. 1948; Moldenke, Alph. List Cit. 2: 329, 332, 339, 344, 346, 349, 393, 400, 420, 422, 435, 436, 447, 491, 498--500, 502, 563, 603, 604, 607, & 639 (1948), 3: 656, 659, 678--681, 721, 764, 783--786, 792, 795, 829, 834, 879, 881--883, 906, 926, 932, & 944 (1949), and 4: 989, 1018, 1020, 1021, 1028, 1031, 1041, 1046, 1050, 1057, 1060, 1094, 1095, 1103, 1120, 1142, 1159, 1213, 1230, & 1242. 1949; W. L. Phillips, Cat. Pl. Fairchild Trop. Gard. 16 & 46. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 22, 29, 157, & 179. 1949; Menninger, Winter 1950 Seed List n.p. 1950; Moldenke, Phytologia 3: 465. 1951; Moldenke, Journ. Calif. Hort. Soc. 15: 80. 1954.

Erect shrub or small tree, 1--6 m. tall; stems to 2.5 cm. in diameter; bark pale; roots deep-seated; branches heavy, gray, subterete, glabrous, often gnarled; branchlets more slender, more or less plainly tetragonal and striate, gray or whitish, cinereous-puberulent or glabrate; nodes not annulate; principal internodes 0.3--4.5 cm. long; twigs numerous, acutely tetragonal, mostly brown and striate, decussate, densely short-pubescent or velutinous with straight, erect, brownish-cinereous hairs; leaf-scars small, sessile or borne on very much abbreviated or subobsolete sterigmata; leaves decussate-opposite, numerous on the confert twigs; petioles slender, 1--10 mm. long, short-pubescent or velutinous like the twigs; leaf-blades dark-green and subnitid above, much lighter and more grayish beneath, chartaceous, often very firm, lanceolate or oblong to elliptic (or ovate), sometimes rhomboid, 1.4--7.2 cm. long, 0.7--4.5 cm. wide, blunt or acute at the apex, rounded or acute to shortly attenuate at the base, not glanduliferous, entire or with 2 or 3 coarse and blunt lobe-like antrorse teeth near the apex, softly and shortly cano-pubescent above, especially along the midrib and larger veins (sometimes completely glabrous above except for the larger venation), densely short-villous-pubescent or velutinous beneath, especially on the venation; midrib very slender, plane or subimpressed above, merely prominulous beneath; secondaries very slender, 3 or 4 pairs, prominulous beneath (and often also above), arcuate-ascending, anastomosing at the margins; veinlet reticulation fine, usually more or less prominulous on both surfaces; racemes terminal and terminating numerous short axillary twigs, abbreviated, 1--8 cm. long, 1--2 cm. wide, densely many-flowered, the terminal one often accompanied by a pair of axillary ones from the uppermost axils; peduncles slender, 4--14 mm. long, densely short-villous-pubescent or velutinous; rachis slender, densely short-

villous-pubescent or velutinous; pedicels very slender, to 1 mm. long or less, densely short-pubescent; prophylla linear, 1--3 mm. long, pubescent; flowers fragrant; calyx turbinate or campanulate, 3--4 mm. long, 2--2.5 mm. wide, striate, densely short-pubescent with spreading hairs, its rim 5-toothed, the teeth subequal, erect, very short, blunt, ciliolate; corolla white or cream-colored, its tube just equaling the calyx, pubescent within, its limb spreading, 5-lobed, about 4 mm. wide, the lobes rounded, puberulent on both surfaces; fertile stamens 4, the fifth one represented by an anatherous rudiment; filaments hairy; fruiting-calyx campanulate, 2--4 mm. long, 3--5 mm. wide, abundantly striate, densely short-villous-pubescent, its rim rather irregularly 5-lobed; fruit subglobose, reddish-green or red when fresh, dark-brown or blackening in drying, 4--5 mm. long and wide, very shiny, obtuse and often apiculate at the apex, 2-lobed, glabrous, crowded on the rachis.

The type of this very abundant species was collected by Cyrus Guernsey Pringle (no. 3222) on rocky hills at Las Canoas, San Luis Potosí, Mexico, on July 15, 1890, and is deposited in the Gray Herbarium at Harvard University. The plant is sometimes described as a tree, 10--15 feet tall, but more usually as a small shrub 3--5 feet tall. It has been found at altitudes of 8--500 meters. The young shoots are brown and densely villous-pubescent like the smaller twigs. It has been collected in anthesis from February to August, and in fruit from February to November. It has been collected along semi-desert roadsides, on flats, in thickets, on hills and rocky hills, in scrub on low ridges, in forests, in the timber belt on the leeward side of clay dunes, and in dry soil, clay soil, and black soil. White records it as "common" in Tamaulipas, while Runyon says it is "frequent but not abundant" or "widespread but not common" in Cameron County, Texas. O. M. Clark describes it as "a small tree on foothills". Vernacular names recorded for it are "fiddlewood", "negrito", and "orcujuela".

The leaves of this species vary greatly in shape. They are softly velutinous, but never harshly scabrous above as in C. scabrum Sessé & Moc. Occasionally they are submarginate at the apex. The short densely flowered spike-like racemes, small leaves, light-colored branches and branchlets, and general grayish appearance characterize this species well. Nevertheless the Texan form has been confused with Duranta plumieri Jacq. [= D. repens L.] and with C. villosum Jacq. [= C. fruticosum var. villosum (Jacq.) O. E. Schulz], while Sessé & Mociffo misidentified it as "Cytharexylum quadrangulare" [= Citharexylum affine D. Don]. It has also been confused in herbaria with C. brachyanthum (A. Gray) A. Gray, Malpighia glabra L. in the Malpighiaceae, and Sideroxylon sp. in the Sapotaceae. It is discussed as C. villosum by Coulter in Contrib. U. S. Nat. Herb. 2: 330 (1894). The fruits are erroneously described as "berries" by Leavenworth.

Edw. Palmer 40 typifies the large-leaved, long-petiolate, long-racemed form of this species, although an isotype at the

Missouri Botanical Garden has a branch of both the ordinary small-leaved form and one of the large-leaved form on the same sheet. The former is in flower, while the latter is in fruit. Liebmann 11360 is somewhat anomalous, reminding one, save for its short racemes and conspicuous pubescence, of C. affine D. Don. The three Regel collections cited below are cotypes of C. tomentosum var. molle and were collected from cultivated material in the botanical garden at Leningrad, deposited in the herbarium there. The species is also cultivated in Santa Clara, Cuba [vid., Grey & Hubbard, List of Plants Growing in the Botanical Garden of the Atkins Institution of the Arnold Arboretum at Soledad, Cienfuegos, Cuba, p. 56. 1933], at Washington, D. C. [Federal Plant Introduction 78537, in 1931], and at the Coconut Grove Plant Introduction Garden and at Chapman Field, Florida. Nealley 121 has the young leaves thin-membranous and nigrescent, the older leaves short-acuminate and serrate. The specific portion of Regel's trinomial is sometimes accredited on herbarium labels to Linnaeus, sometimes to Kunth.

In all, 229 herbarium specimens, including the types of all the names involved, and 19 mounted photographs have been examined.

Citations: TEXAS: Cameron Co.: Clover 1237 (Du--247833, Fs, Gg--233311), 1694 (Fs, Mi, N); Collector undesignated 2015 (F--955752); Cory 36624 (N, N), 51396 (N, Sm); Crockett s.n. [9-20-30] (Au); Ferris & Duncan 3051 (Ba, Du--124678, Gg--31071, N, W--1089338); G. L. Fisher 41195 (Gg, Hp); C. L. Lundell 10715 (N); Lundell & Lundell 8643 (Ld, Mi, N), 8668 (Ld, Mi, N), 10001 (Ld, N); McKelvey 1775 (A); Nealley 121 (W--60822); Owens & Parks R.1713 (Au), R.1714 (Au); R. Runyon 211 (W--1365589), 363 (Au), 486 (Rr, W--1113798), 2174 (Rr), 3838 (N, Sm), s.n. [Brownsville] (N); Schott 39 (F--42236); Shiller 659 (Au); Small & Wherry 11895 (N); Tharp 1227 (W--1116133), 1249, in part (W--1116151), 1852 (Au, N, W--1203140). Hidalgo Co.: H. B. Parks 18044 (Tr). Willacy Co.: Tharp 1249, in part (N). Green Island: Tharp 392 (Au), 1227 (N), 1249, in part (Au, Au, Au, Au, Au, Au, N). County undetermined: Hi Way Dept. 10112 [Gulf Coast of Texas] (F--841835); L. H. Pammel s.n. [S. Texas, Feb. 1929] (Io--138026). MEXICO: México: Karwinski s.n. [Toluca] (L). Oaxaca: Aguirre Benavides 27 (N), San Luis Potosí: Kenoyer A.642 (F--1003513), s.n. [Valles, 9-3-38] (Fs); W. C. Leavenworth 232 (Ld, N, Ur); Lundell & Lundell 7280 (Fs, Mh, N, N); Edw. Palmer 29 (Ca--139880, E--119124, F--176042, G, K, Mi, N, N--photo, W--470883, Z--photo), 40 (Ca--148629, E--119125, F--176054, G, K, N, W--470894), 90 (Ca--139874, Cp, E--134934, F--176423, G, K, N, N, W--470951); Pringle 3222 (A--isotype, B--isotype, B--photo of type, Bm--isotype, Br--isotype, C--isotype, Ca--104980--isotype, Cb--isotype, Cm--isotype, D--isotype, E--119122--isotype, Ed--isotype, Es--isotype, F--109548--isotype, G--type, K--iso-

type, K--photo of type, L--isotype, Me--isotype, Me--isotype, Mu-1736--isotype, N--photo of type, Ob--50627--isotype, P--isotype, Pa--isotype, S--isotype, S--photo of type, V--904--isotype, Vt--isotype, Vu--isotype, W--57333--isotype, W--1323183--isotype, X--isotype, Z--photo of type), 3734 (B, Bm, Br, C, Ca--169177, Cb, D, E--119123, Ed, F--220134, F--263748, G, Io--38741, J, K, L, Me, Me, Me, Mu--3841, Ob--50628, P, Pa, Pl--22588, S, V--9804, Vt, Vu, W--46918, W--1323192, X); Virlet d'Aoust 825 (P). Veracruz: Karwinski s.n. [Del Corozal] (L); Liebmann 11360 (Ca--424378, Cp, F-689262); Purpus 6140 (B, Bm, Ca--168095, Cb, E--704895, F--386651, G, N, W--464663). State undetermined: Karwinski 705 (L), 706 (L), 706b (L); Sessé, Mociffo, Castillo, & Maldonado 2374 (F--849481, Q). CULTIVATED: Florida: Fennell & Jones 846 (Ar--17127); Wal-singham s.n. [Chapman Field; F. P. I. 78537] (Ba). New York: Tansey s.n. [N. Y. Bot. Gard. Cult. Pl. 75022] (N). Russia: Regel s.n. [Hort. Bot. Petropol. 56.6] (B--photo, K--photo, L, N--photo, S--photo, Z--photo), s.n. [Hort. Bot. Petropol. 58.6] (L), s.n. [Hort. Bot. Petropol. 65.8] (B--photo, K--photo, L, N--photo, S--photo, Z--photo). Texas: Buckner s.n. [Genoa] (A, N, N).

CITHAREXYLUM BOURGEOUANUM Greenm., Field Columb. Mus. Publ. Bot. 2: 185. 1907.

Literature: Greenm., Field Columb. Mus. Publ. Bot. 2: 185. 1907; Prain, Ind. Kew. Suppl. 4: 49. 1913; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 1: 53 & 302 (1946) and 2: 333, 348, & 425. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 51. 1948; Moldenke, Alph. List Cit. 3: 741 (1949) and 4: 1037 & 1057. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949.

Tall tree; branchlets medium-stout, light-colored, medullose, obtusely or acutely tetragonal, densely short-pubescent toward the apex, becoming merely puberulent or even glabrate in age, the older ones and the branches lenticellate; nodes often greatly ampliate, mostly obscurely annulate; principal internodes 0.7--5.5 cm. long; leaf-scars prominent, broad, borne on ascending sterigmata, which are often much enlarged and very corky, usually with small densely white-woolly buds in their axils; leaves decussate-opposite or the uppermost occasionally approximate; petioles slender or rather stoutish, 9--16 mm. long, canaliculate above, finely short-pubescent especially when young, becoming subglabrate; leaf-blades thin-membranous, dark-green on both surfaces, shiny above, oblong or elliptic, 6.5--15 cm. long, 2.3--7.9 cm. wide, acute or acuminate at the apex, entire, acute or acuminate at the base and slightly prolonged into the petiole, but not glanduliferous, glabrous (except for the midrib when immature) above, rather densely short-pubescent or velutinous (especially along the venation) with fuscous hairs beneath; midrib slender (or stout at the base), light in color, usually impressed above, prominent and conspicuous beneath; secondaries slender, 4--10 pairs, irregularly disposed, arcuate-ascending,

often slightly impressed above, prominent beneath and plainly anastomosing near the margins; veinlet reticulation fine, prominent beneath and often very slightly so above; racemes axillary (in the uppermost leaf-axils) and terminal, 7.5--25 cm. long, about 2 cm. wide, erect, rather loosely many-flowered; peduncles slender, very short or obsolete, densely short-pubescent; rachis slender, densely short-pubescent with fuscous hairs; pedicels slender, 1--2 mm. long, pubescent; bractlets occasionally present, lanceolate, to 1 cm. long; larger bracts usually alternate to approximate or in several pairs along that portion of the twigs between the uppermost pair of leaves and the peduncle, caducous; prophylla linear-setaceous or subulate, 1--2 mm. long, pubescent, equaling or slightly surpassing the stoutish pedicels, some recurved and more or less persistent; calyx subtubular or deeply cupuliform, about 5 mm. long, hirtellous outside, slightly puberulent within, the rim crenately 5-lobed; corolla subsalveriform, white, its tube equaling or barely surpassing the calyx, pubescent in the throat, the lobes oblong, 3 mm. long, pubescent on both surfaces; fruiting-calyx and fruit not seen.

The type of this species was collected by Eugène Bourgeau (no. 2525) -- in whose honor it is named -- in the region about Orizaba, Veracruz, Mexico, on June 24, 1866, and is deposited in the Gray Herbarium of Harvard University. The flowers are described as white or flesh-colored, and the plant as "un grand arbre". It inhabits humid forests, according to Botteri, and has been collected in anthesis in June and July. Its flowers remind one greatly of those of C. chartaceum Moldenke. It has hitherto been confused with C. lucidum Schlecht. & Cham. and C. villosum Jacq. [= C. fruticosum var. villosum (Jacq.) O. E. Schulz] and misidentified as C. caudatum L. and as "Citharexylum lucidum Cham." In all, 34 herbarium specimens, including the type, and 7 mounted photographs have been examined.

Citizens: MEXICO: Veracruz: Botteri 880 (G), 1045 (Bm, Cb, D, K, K, N, N--photo, P, P, W--771908, X, Z--photo), 1092 (A, E--921457, F--118989, F--689833, G, N, W--58034, W--1323186), s.n. [Orizaba] (P); Botteri & Sumichrast 1872 (P); Bourgeau 2525 (B--isotype, B--photo of type, Br--isotype, F--998394--isotype, G--type, K--isotype, K--photo of type, Le--isotype, N--photo of type, P--isotype, P--isotype, P--isotype, S--isotype, S--photo of type, X--isotype, Z--photo of type); C. T. Mohr 324 (W--771909), s.n. [Orizaba] (D--824293).

CITHAREXYLUM BRACHYANTHUM (A. Gray) A. Gray, Syn. Pl. N. Am., ed. 2, 2 (1): 458. 1886.

Synonymy: Lycium brachyanthum A. Gray ex Hemsl., Biol. Cent.-Amer. Bot. 2: 426. 1882. Lycium berlandieri var. normale subvar. brachyanthum (A. Gray) Terrac., Malpighia 4: 520. 1891. Citharexylum brachyanthum (Hemsl.) A. Gray ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. Citharexylum brachyanthum Gray ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941.

Citharexylon brachyanthum Gray ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947.

Literature: Hemsli., Biol. Cent.-Amer. Bot. 2: 426. 1882; A. Gray, Syn. Fl. N. Am., ed. 2, 2 (1): 458. 1886; Terrac., Malpighia 4: 520. 1891; Coult., Contrib. U. S. Nat. Herb. 2: 330. 1894; J. K. Small, Fl. Southeast. U. S., ed. 1, 1014 (1903) and ed. 2, 1014. 1913; C. L. Hitchc., Ann. Mo. Bot. Gard. 19: pl. 13 & 19. 1932; Cory, Texas Agr. Exp. Sta. Bull. 550: 88. 1937; Moldenke, Geogr. Distrib. Avicenn. 4 & 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 16 & 32. 1940; Moldenke, Suppl. List Invalid Names 2. 1941; Worsdell, Ind. Lond. Suppl. 1: 233. 1941; Moldenke, Alph. List Invalid Names 14 & 33. 1942; Lundell, Contrib. Univ. Mich. Herb. 8: 82--83. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 12, 16, & 88. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 74--75. 1942; Moldenke, Phytologia 2: 95. 1944; Moldenke, Alph. List Cit. 1: 178, 192, 246, 302, 306, 307, 311, 313, & 314. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; Moldenke, Phytologia 2: 327. 1947; Moldenke, Wrightia 1: 244. 1948; Moldenke, Alph. List Cit. 2: 343, 370, 371, 393, 419, 422, 429, 437, 447, 498, 499, 593, & 615 (1948), 3: 668, 677, 683, 763, 787, 799, 829--831, 833, 834, 872, 933, & 934 (1949), and 4: 1020, 1024, 1028, 1031, 1038, 1060, 1148, 1241, & 1245. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 22, 29, & 179. 1949.

Illustrations: C. L. Hitchc., Ann. Mo. Bot. Gard. 19: pl. 13 & 19. 1932.

Loosely and intricately branched shrub, to 2.5 m. tall; branches and branchlets irregular, twiggy, rather slender, often nigrescent in drying, acutely or obtusely tetragonal (the older branches subterete), the angles margined with white or gray corky ridges, glabrous; wood yellow; twigs usually short and sharp-pointed, gray or blackish, the youngest shoots densely short-pubescent with canescent hairs; nodes not annulate; principal internodes abbreviated, 5--25 mm. long; leaf-scars small, not stalked; leaves decussate-opposite on young shoots, clustered on extremely abbreviated spur-like branchlets, which are numerous and decussate-opposite, on older wood; petioles none; leaf-blades thin-chartaceous, oblanceolate or spatulate, often curled in drying, 2--24 mm. long, 1--6 mm. wide, rounded or subacute at the apex, entire, cuneate at the base, not glanduliferous, densely canescent-pubescent on both surfaces; midrib often almost indiscernible; secondaries and veinlet-reticulation none; racemes apparently axillary, actually terminating the extremely short spur-like branchlets, reduced to 1 or 2 flowers, often borne in pairs at every node along the wood of 1, 2, or even 3 years back; bracts and bractlets none; pedicels slender, about 1 mm. long, canescent-pubescent; corolla white; fruiting-calyx patelliform or shallowly cupuliform, somewhat indurated, about 2 mm. long and 4 mm. wide, 5-toothed from a subtruncate rim, puberulent; fruit red or orange-red when ripe, white and pink when young, subglobose, shiny, about 5 mm. long and wide, glabrous, corrugated in drying, apiculate by the persistence of the style, apparently sparingly produced.

The species was based by Asa Gray on three collections of Edward Palmer as cotypes: no. 866 (the logotype), from the mountains on the west side of Saltillo, Coahuila, Mexico, collected between August 14 and 17, 1880, no. 863, from a section of low mountains with a few oaks at Soledad, 25 miles southwest from Monclova, Mexico, collected between September 9 and 19, 1880, and no. 963, from Laredo on the Rio Grande in southwestern Texas, collected in August, 1879, all deposited in the Gray Herbarium of Harvard University.

The species has been collected in anthesis from May to September, and in fruit from June to September. It has been found at altitude of 1300 to 8000 feet. It inhabits dry hills, valleys, dry valley floors, plains, low ridges, mesas, desert plains, arid limestone hillsides, crevices of limestone slopes, mountains, thin limestone soil, and barren gypsum soil, in scrub, and with Larrea and Flourensia on limestone soil. Hinton says it is frequent as scattered plants or in thinly populated colonies of small size in Coahuila. Vernacular names are "charasquillo" and "chile pájaro".

The largest leaves so far seen by me are on the sheet of Edwards 292 at Austin. In habit the species reminds one much of a Lycium or of some species of Bumelia. Most collectors describe it as a shrub 2--5 feet tall, with white flowers.

The binomial, Citharexylum brachyanthum, is occasionally erroneously accredited to "(Hemsl.) Gray". Curiously, it has been omitted from the "Index Kewensis" and all its supplements to date! C. L. Hitchcock, in connection with his splendid work on the genus Lycium (Solanaceae), which this species so closely resembles superficially, has examined a number of specimens of C. brachyanthum sent to him in error, and has annotated them in this inaccurate manner. The Mackenzie 124 and Shreve 8577, distributed as Citharexylum brachyanthum, are actually Lycium berlandieri Dunal, while Reineck s.n. [IV.1898] from Brazil, also distributed as Citharexylum brachyanthum, is the type collection of Basistemon brasiliensis Moldenke in the Scrophulariaceae. The Schott s.n. at the Chicago Natural History Museum (F--42081), determined as Citharexylum brachyanthum var. glabrum by C. L. Hitchcock, and so annotated by him, is Lycium berlandieri. It is from Eagle Pass, Texas, while Palmer 867 is a mixture of Citharexylum brachyanthum and Lycium berlandieri. These two species, in two entirely different genera and families, are astoundingly similar in general appearance!

Endlich 161 differs somewhat in its much shorter and more sparse pubescence on the leaf-blades, which, indeed, are only minutely puberulent -- a condition which, however, is approached on older portions of many specimens (e.g., Rose, Painter, & Rose 9004). The Parry 723, cited below, may be from Nuevo Leon or even from Texas; its label merely states "En route from San Luis Potosí to San Antonio, Texas". In all, 118 herbarium specimens of this species, including the type collections of all the names

involved, and 10 mounted photographs have been examined.

Citations: TEXAS: Webb Co.: Edw. Palmer 963 (E--photo of cotype, G--cotype, K--cotype, K--photo of cotype, N--cotype, N--photo of cotype, Ph--cotype, S--photo of cotype, W--53032--cotype, Z--photo of cotype). Zapata Co.: Lundell & Lundell 12664 (N). MEXICO: Chihuahua: J. Gregg 570 (E--127289). Coahuila: Herb. Inst. Biol. Univ. Mex. 7161 (Me); Hinton 16525 (N), 16554 (N); I. E. Johnston 7048 (S); Edw. Palmer 866 (E--photo of cotype, D--cotype, G--cotype, K--cotype, K--photo of cotype, N--photo of cotype, S--photo of cotype, W--57334--cotype, W--1335220--cotype, Z--photo of cotype), 867, in part (C, C, F--302799, G, K, W--58035, W--1335219), 868 (D--cotype, G--cotype, K--cotype, W--58036--cotype, W--1335218--cotype); Purpus 4502 (B, Ca--143254, F--344098, G, W--841879); Shreve 8421 (Fs, Mi); Wynd & Mueller 9 (E--1113674, Fs, I, N, S, Ur, Ur). Durango: Endlich 161 (E). Hidalgo: Purpus 1837 (Ca--139878, E--119048, F--193342, G, N, W--570630); Rose, Painter, & Rose 9004 (N, W--452484). Nuevo Leon: O. M. Clark 6653 (N); M. T. Edwards 292 (Au, Du--276810, F--904024, OK); Parry 14 1/2 (G); Pringle 11818 (B, Cp, F--179137, Fs, G, It, K, Le, Na--25816, W--461273). San Luis Potosí: C. L. Lundell 5344 (Au, Du--234991, F--754561, K, Ld, Me, Mi, N), 5356 (F--754551, Fs, Gg--233398, I, Ld, Mi, N, S); Parry 723 (G); Pringle 3749 (C, Ca--26129, Cb, Cb, D, E--127237, E--127289, F--263763, G, Gg--164090, Io--38742, J, K, Me, Me, Mu--3904, Pa, S, V--9613, Vt, W--57337). Zacatecas: Kirkwood 66 (F--245565, G); Lloyd 50 (W--574015); Pringle 7461 (F--120225, G, Mu--4150, Vt, W--305751); Shreve 8590 (Fs), 9203 (Fs, Mi). State undetermined: J. Gregg 194 (G), 494 (G), s.n. [near Audabazo] (G).

CITHAREXYLUM BRAZOSENSE Berry, U. S. Geol. Surv. Prof. Paper 92: 197, pl. 64, fig. 1 [as Citharexylon]. 1924; Moldenke, Geogr. Distrib. Avicenn. 41. 1939.

Literature: Berry, U. S. Geol. Surv. Prof. Paper 92: 197, pl. 64, fig. 1. 1924; O. M. Ball, Texas Agr. & Mech. Coll. Prof. Paper, ser. 4, 2 (5): 171, pl. 30, fig. 8. 1931; Moldenke, Geogr. Distrib. Avicenn. 41. 1939; Moldenke, Prelim. Alph. List Invalid Names 15. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 88. 1942; Moldenke, Alph. List Invalid Names 13. 1942; Moldenke in Lundell, Fl. Texas 3 (2): 75. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 42. 1943; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 166 & 179. 1949.

Illustrations: Berry, U. S. Geol. Surv. Prof. Paper 92: pl. 64, fig. 1. 1924; O. M. Ball, Texas Agr. & Mech. Coll. Prof. Paper, ser. 4, 2 (5): pl. 30, fig. 8. 1931.

Petioles short and stout, about 4 mm. long, wing-margined; leaf-blades subcoriaceous, broadly elliptic in outline, widest at the median region, about 6.5 cm. long and 3.25 cm. wide, acute or subacuminate at the apex, slightly decurrent at the base, entire; midrib stout, prominent on the under side of the leaf;

secondaries fairly stout, about 7 pairs, unequally spaced, diverging from the midrib at an angle of about 45° , upwardly curvate, camptodrome in the marginal region; tertiaries comprising pseudo-secondaries subparallel with and between some of the secondaries and numerous thin nervilles, which fork and anastomose midway between the larger veins.

The species was described from a specimen collected by O. M. Ball in the Fayette sandstone of Upper Sonoran age, by Mossy Creek, 3 miles southwest of Wellborn, Brazos County, Texas, and deposited in the United States National Museum at Washington.

CITHAREXYLUM CAUDATUM L., Sp. Pl., ed. 2, 2: 872 [as Citharexylon]. 1763; L., Syst. Nat., ed. 12, 416 [as "Citharexylum caudatu"]. 1767; L., Syst. Nat., ed. 13, 416. 1770.

Synonymy: Berberis fructu, arbor maxima, bacc. rac. Sloane, Cat. Pl. Ins. Jamaic. 170. 1696. Berberis fructu arbor maxima racemosa, foliis integris, obtusis; flore albo, pentapetalo odoratissimo; fructu nigro, monoppyreno Sloane, Hist. Jamaic. 2: 99, pl. 206, figs. 3 & 4. 1725. Citharexylon fruticosum, foliis subellipticis, petiolis pedatis, calicibus truncatis, spicis terminalibus longioribus P. Browne, Civil & Nat. Hist. Jamaic., ed. 1, 265, pl. 28, fig. 2. 1756. Jasminum arborescens, racemosum, foliis lauri Plum., Pl. Amer., ed. Burm., 7: 151, pl. 157, fig. 2. 1758. Citharexylon racemis longissimis Plum., Pl. Amer., ed. Burm., 7: 151. 1758. Citharexylum album Mill., Gard. Dict., ed. 8, no. 2. 1768. Citharexylon erectum Sw., Prodr. Veg. Ind. Occ. 91. 1788. Citharexylon erectum Sw. ex Jacq., Ic. Pl. Rar., ed. 2, 3: pl. 501. 1793. Citharexylon album Mill. ex Steud., Nom. Bot., ed. 1, 202, in syn. 1821. Citharexylon berterii Spreng., Syst. Veg., ed. 16, 2: 763. 1825. Jasminum arborescens racemosum etc. Plum. apud Walp., Repert. 4: 75, in syn. 1845. Citharexylum berterii Spreng. ex Schau. in A. DC., Prodr. 11: 614. 1847. Citharexylum erectum Jacq. apud Schau. in A. DC., Prodr. 11: 612, in syn. 1847. Citharexylum surrectum Griseb., Fl. Brit. West Ind. 497, in part. 1361. Citharexylum caudatum Seem. ex Griseb., Fl. Brit. West Ind. 497, in syn. 1861 [not C. caudatum Donn. Sm., 1907, nor Sw., 1847, nor Sagra, 1909]. Citharexylum lindenii Turcz., Bull. Soc. Nat. Mosc. 36 (3): 208. 1863. Citharexylum caudatum Sieb. ex Briq., Bull. Herb. Boiss. 4: 342 [as "caudato"]. 1896. Citharexylum fruticosum, fol. subellipticis, pet. ped. P. Browne apud O. E. Schulz in Urb., Symb. Antill. 6: 58, in syn. 1909. Citharexylum quadrangulare A. Rich. apud O. E. Schulz in Urb., Symb. Antill. 6: 58, in syn. 1909 [not Citharexylon quadrangulare Jacq., 1760, nor Citharexylum quadrangulare L., 1786, nor Hort. Matrit., 1845, nor Schau., 1864, nor Sessé & Moc., 1894, nor Boutelou, 1907, nor Millsp., 1907, nor Griseb., 1909, nor Jacq., 1909, nor Hort., 1911]. Citharexylum candatum L. ex

Roig, Est. Exp. Agron. Santiago Vegas Bol. 54: 340, sphalm. 1928. Citharexylum berterii Spreng. ex Roig, Est. Exp. Agron. Santiago Vegas Bol. 54: 793, in syn. 1928. Citharexylum caudatum f. parvifolium Urb. ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. Citharexylum caudatum var. parvifolium O. E. Schulz ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. Citharexylum caudatum Cham. & Schlecht. ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. Citharexylum emarginatum Vahl ex Moldenke, Prelim. Alph. List Invalid Names 15, in syn. 1940. Citharexylum emarginatum Vahl ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940 [not C. emarginatum Briq., 1941]. Citharexylum suberectum Griseb. ex Roig, Plant. Med. Cuba 533, in syn. 1945. Cithaexylum caudatum L. ex Roig, Plant. Med. Cuba 778, sphalm. 1945. Cithaexylum berterii Spreng. ex Roig, Plant. Med. Cuba 778, in syn. 1945. Cithaexylum lucidum Cham. ex Roig, Plant. Med. Cuba 778, in syn. 1945. Cithaexylum suberectum Griseb. ex Roig, Plant. Med. Cuba 778, in syn. 1945. Citharexylum plumerii Plum. ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947 [not Citharexylum plumieri Otto, 1940]. Citharexylum caudatum L. ex Alain in León & Alain, Fl. Cuba 4: 301. 1957. Citharexylum berterii Spreng. ex Alain in León & Alain, Fl. Cuba 4: 301, in syn. 1957. Citharexylum lucidum Cham. ex Alain in León & Alain, Fl. Cuba 4: 301, in syn. 1957. Citharexylum lindenii Turcz. ex Alain in León & Alain, Fl. Cuba 4: 301, in syn. 1957. Citharexylum quadrangulare A. Rich. ex Alain in León & Alain, Fl. Cuba 4: 301, in syn. 1957. Erythroxyllum retusum C. Wright, in herb. [not E. retusum Bauer, 1867, nor Baill., 1907].

Literature: Sloane, Cat. Pl. Ins. Jamaic. 170. 1696; Sloane, Hist. Jamaic. 2: 99, pl. 206, figs. 3 & 4. 1725; P. Browne, Civil & Nat. Hist. Jamaic. 265, pl. 28, fig. 2. 1756; Plum., Pl. Amer., ed. Burm., 7: 151, pl. 157, fig. 2. 1758; Sandm., Fl. Jamaic. 18. 1759; L., Amoen. Acad. 5: 380. 1759; L., Sp. Pl., ed. 2, 2: 872. 1763; L., Sp. Pl., ed. 3, 2: 872. 1764; L., Syst. Nat., ed. 12, 416. 1767; Mill., Gard. Dict., ed. 8, no. 2. 1768; L., Syst. Nat., ed. 13, 416. 1770; Murr. in L., Syst. Veg., ed. 13, 472. 1774; Murr. in L., Syst. Veg., ed. 14, 564. 1784; Sw., Prodr. Veg. Ind. Occ. 91. 1788; Jacq., Coll. Bot. 3: 231. 1789; Sw., Obs. Bot. 234. 1791; Jacq., Ic. Pl. Rar., ed. 2, 3: pl. 501. 1793; Salisb., Prodr. 108. 1796; Cmel. in L., Syst. Nat., ed. 13, 2 (2): 943. 1796; Lam., Illustr. 3: pl. 545, figs. a--f. 1797; Sw., Fl. Ind. Occ. 2: 1044. 1800; Desf., Tabl. Ecol. Bot., ed. 1, 54. 1804; Pers., Syn. Pl. 2: 142. 1806; Poir., Encycl. Meth. Bot. Suppl. 2: 367. 1811; Lunan, Hort. Jamaic. 1: 292. 1814; Cels, Cat. Arbres 11. 1817; Poir. in Lam., Dict. Sci. Nat. 9: 285. 1817; Steud., Nom. Bot., ed. 1, 202. 1821; Spreng., Syst. Veg., ed. 16, 2: 763. 1825; Cham. & Schlecht., Linnaea 5: 97. 1830; Richter, Linn. Op. 603. 1835; Steud., Nom. Bot., ed.

2, 1: 375. 1840; Walp., Repert. 4: 77--78. 1845; Schau. in A. DC., Prodr. 11: 611--612 & 614. 1847; A. Rich. in Sagra, Hist. Fis. Cuba 11: 143. 1850; Griseb., Abhand. König. Gesell. Wissen. Götting. 7: 256. 1857; Griseb., Fl. Brit. West Ind. 497--498. 1861; Griseb., Pl. Wright. 2: 529. 1862; Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 208--209. 1863; Griseb., Cat. Pl. Cub. 216. 1866; Sauv., Fl. Cub. 112. 1868; Hemsl., Biol. Centr.-Amer. Bot. 2: 536. 1882; Lefroy Bull. U. S. Nat. Mus. 25: 97. 1884; Fawcett, Econom. Pl. 29. 1891; Fawcett, Prov. List Indig. Nat. Fl. Pl. Jamaic. 29. 1893; Jacks., Ind. Kew. 1: 549. 1893; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 159. 1894; Northrop, Mem. Torrey Bot. Club 12: 62. 1902; O. E. Schulz in Urb., Symb. Antill. 6: 56--59. 1909; Britton & P. Wils., Scient. Surv. Porto Rico 6: 144. 1925; León in Shelford, Nat. Guide Amer. 687. 1926; Roig y Mesa, Est. Exp. Agron. Santiago Vegas Bol. 54: 170, 198, 340, 558, & 793. 1928; Stapf, Ind. Lond. 2: 220. 1930; Standl., Field Mus. Publ. Bot. 10: 335. 1931; Grey & Hubbard, List Pl. Bot. Gard. Atkins Inst. 56. 1933; Standl., Field Mus. Publ. Bot. 18: 999. 1938; Moldenke, Alph. List Common Names 4, 9, 10, 12, 14, 17, 20, 21, 23--25, 27, & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 4--7, 10, 13, 15--17, 23, & 36. 1939; Moldenke, Suppl. List Common Names 9 & 17. 1940; Moldenke, Carnegie Inst. Wash. Publ. 522: 193--194. 1940; Moldenke, Prelim. Alph. List Invalid Names 15--17. 1940; Lundell, Contrib. Univ. Mich. Herb. 8: 60. 1942; Moldenke, Alph. List Invalid Names 13--15. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16, 19--27, 29, 34, 71, & 88. 1942; Bol. Mus. Hist. Nat. Jav. Prado 7: 245. 1943; Moldenke, Phytologia 2: 95--96. 1944; Roig y Mesa, Plant. Med. Cuba 533--534 & 778. 1945; Moldenke, Alph. List Cit. 1: 3, 7, 18, 21, 23--25, 27, 32, 39, 40, 53, 60--62, 65, 66, 72, 74, 89, 97, 118, 120, 123, 128, 130, 135, 138, 139, 147, 148, 153, 166, 170, 175, 179, 184--188, 193, 197, 198, 208, 221, 227, 231, 232, 234, 235, 247, 258--261, 267, 268, 272, 273, 283, 287, 301--303, 305, 308, 311, 312, 315--317, & 319--321. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 4 & 5. 1947; Moldenke, Castanea 13: 115. 1948; Moldenke, Alph. List Cit. 2: 328--335, 343, 346, 348--352, 393, 401, 403, 410, 419, 420, 423, 427, 428, 431, 436, 437, 446, 448, 460, 465, 469, 479, 486, 499, 501, 502, 504, 549, 569, 578, 579, 582, 583, 587, 605, 609, 614, 625, 643, & 646--652 (1948), 3: 653, 664, 675--677, 686, 706, 715, 716, 722, 740, 757, 765, 773, 775, 777, 782, 801, 802, 809, 813, 816--818, 828, 838, 842, 847, 853, 856, 866--868, 878, 886, 902, 913, 924, 928--930, 933, 934, 937, 938, 947, 948, 959--962, 969--971, & 974 (1949), and 4: 982, 983, 995, 1013, 1016, 1020, 1026, 1027, 1029--1039, 1042--1044, 1047--1049, 1051, 1052, 1054, 1055, 1057, 1061, 1065--1068, 1076, 1097, 1099, 1114, 1120, 1133, 1143--1146, 1151, 1162, 1231, 1232, 1293, & 1304. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29, 34, 36, 37, 39, 40, 42, 43, 45--47, 49, 54, 59, 71, 157, & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Moldenke, Rev. Sudam. Bot. 8: 172. 1950; Moldenke, Phytologia 3: 375. 1950; Moldenke, Phytologia 3: 451 and 4: 192. 1951; Roig y Mesa, Dicc. Bot. Cub. 260, 296, 441,

442, 477, 824, & 1003. 1953; Moldenke, Inform. Set 48 Spec. [2]. 1954; Alain in León & Alain, Fl. Cuba 4: 299 & 301. 1957.

Illustrations: Sloane, Hist. Jamaic. 2: pl. 206, figs. 3 & 4. 1725; P. Browne, Civil & Nat. Hist. Jamaic., ed. 1, pl. 28, fig. 2 (1756) and ed. 2, pl. 28. 1789; Lam., Illustr. 3: pl. 545, figs. a--f. 1797.

Openly branched but graceful shrub or small, slender, straggling, round-headed tree or treelet, to 20 m. tall, occasionally vine-like; stem to 20 cm. in diameter at breast height; bark white; branches and branchlets medium, tetragonal or subterete, often striate, glabrous, rather medullose, brownish (or the young shoots nigrescent in drying; nodes obscurely annulate; principal internodes 1--7 cm. long; leaf-scars large, borne on corky sterigmata, which on the larger branches are very large and prominent; leaves decussate-opposite; petioles slender or stoutish, 0.3--2.4 cm. long, glabrous; leaf-blades firmly chartaceous or subcoriaceous (or even coriaceous), rather dark-green and very shiny above, lighter and shiny beneath, varying from lanceolate or oblong to narrowly elliptic, 4--17.5 cm. long, 2.4--7.7 cm. wide, blunt or subacute at the apex (rarely apiculate or emarginate), entire, cuneately narrowed to the base, with the margins recurved to enclose a pair of elongate dark glands at the base, punctate beneath, very glabrous on both surfaces; midrib rather stout, prominent beneath, often prominent or prominulous above, orange-brown above and light-brown or pale greenish-white beneath and suffused below with buff when fresh; secondaries very slender, 4--7 pairs, distant, arcuate-ascending, often rather inconspicuously anastomosing near the margins, mostly prominulous beneath; veinlet reticulation delicate, sparse, often obscure; racemes axillary or terminal and terminating axillary branchlets, erect or pendent, 3--33 cm. long, 1--1.5 cm. wide, densely many-flowered, unbranched or rarely furcate; peduncles rather slender, 0.5--4.5 cm. long, glabrate; rachis slender, grass-green when fresh, glabrous or subglabrate; pedicels very slender, 1--2.5 mm. long, glabrate; bracts occasionally present, foliaceous, lanceolate, to 2.5 cm. long and 1 cm. wide, glabrous on both surfaces; prophylla setaceous, 1--2 mm. long, glabrate; flowers fragrant; calyx campanulate or cyathiform, 3--4.5 mm. long, mostly glabrate on the outside, its tube pale-green, its rim subtruncate and entire or minutely apiculate or obsoletely 5-repand-dentate, obscurely ciliate; corolla infundibular, white or cream-colored, 5-8 mm. long, its tube about twice as long as the calyx, tomentose at the apex and within, villous at the throat, its limb 5-lobed, 4--5 mm. wide, lobed 1/3 to 2/3 its length, the lobes subobovate; stamens 4; filaments about 0.5 mm. long; anthers about 1 mm. long; staminode rudimentary; pistil about 3.5 mm. long; style about 2 mm. long; stigma bilobed, broader than the style; ovary obovate; fruiting-pedicels to 3 mm. long; fruiting-calyx cupuliform or eventually patelliform, light and herbaceous or indurated, to 3 mm. long and 4 mm. wide, 5-angled, glabrous, its rim subtruncate, 5-apiculate or eventually irregularly erose and split; fruit varying from oblong or globose-oblong to obovate or

subglobose, very shiny, 6--12 mm. long, 5--10 mm. wide, glabrous, from reddish-green or yellow to orange or red, turning shiny black when mature and in drying, acute-tipped; pyrenes one-celled; embryo elliptic, 4.5--6.5 mm. long, about 2.5 mm. wide and 1 mm. thick; radicle about 0.5 mm. long.

The type of this very common and distinct species was collected by Patrick Browne in Jamaica and is specimen number 5 under genus 777 in the Linnean Herbarium at London. The type of C. berterii was collected by Carlo Guisepe Bertero (no. 169) -- in whose honor it was named -- also in Jamaica. The type of C. lindeni was collected by Jean Jules Linden (no. 1739) -- in whose honor it was named -- on Mount Liban, Oriente, Cuba, in 1843 or 1844. The type of C. album was collected from a cultivated plant in the Chelsea garden near London, England, grown from seeds sent by William Williams from Jamaica.

The species is said by collectors to inhabit open forests, especially swampy places, thickets and forests along beaches, brushy slopes, moist forests and forest borders, hammocks, hills, pastures, pinelands and pine ridges, open creek beds, the sides of railroad tracks, rocky and bracken-filled thickets, margins of woods near the seashore, mountain forests, advanced and savanna forests, oaklands, arroyos, steep slopes, low ground, limestone plains, riverbanks, the edges of pools and coastal swamps, wet forests and wooded swamps, beaches, mangrove swamps and thickets, sand-dunes near the beach, open very moist habitats, and, in general, the littoral belt. It is frequent at the edges of woods and in swampy pine forests, jungles, and the transition bush between the mangrove swamps and the pine ridge associations. It has been collected in anthesis in every month of the year, and in fruit from December to August and in October. Baker describes it as a "very openly branched but graceful shrub", whose white flowers and red "berries" (drupes) make it decidedly ornamental and worth cultivating. The fruit is described as orange by Bartlett, red by Yuncker, black by Schipp, blue by Killip, and shining scarlet by Harris. It grows from sea-level to considerable altitudes, being found at 3500 feet in Cuba, and at 4800 feet in Jamaica. Its dark branches, sparse leaf-venation, and complete lack of pubescence characterize this species well. The flowers are described as white, creamy, or yellow, and the trunk is said to attain a diameter of 5 inches or more. The immature leaves are membranous, but glabrous (not strigillose as in C. fruticosum var. brittonii, from which the color of its branches also distinguishes it). Schipp 263 has the upper leaf-surface marked with numerous elevated punctae and is described as "rare" in British Honduras. Jack 6874, 7243, 7255, and 7436 represent an especially small-leaved form with the leaf-blades regularly 1.5--6.5 cm. long and 1.1--2.2 cm. wide and with greatly abbreviated racemes. Ekman 13902, 19437, and H.1248 represent the same form, which Schulz designated as "forma parvifolia" or "var. parvifolium".

Lehmann states that the flowers are white and fragrant and the

branches weak and drooping, and that the species inhabits brackish localities. The latter claim is further attested to by the fact that numerous collectors have found it in mangrove thickets. According to Roig its stems are used for wood in Cuba, and it is valuable as a honey-plant. He quotes Grosourdy to the effect that the inner bark of this and other West Indian species is considered in Puerto Rico to be a very powerful emmenagogue and abortive. A handful of the recently gathered or dried fruit is cleaned and chopped, placed into about 1.38 liters of boiling water in a vessel over live coals or hot ashes, forming an infusion that is sweetened and served in cups at the end of the day. The flowers have a very delicate odor like that of orange or lemon blossoms and are considered as a pectoral in Guadeloupe, prepared by placing a handful of the flowers in 1.38 liters of boiling water. A tea is similarly made in the treatment of diarrhoea and for afflictions of the chest. A syrup prepared with 2 parts of sugar is much stronger and is said to be a very good pectoral. An infusion prepared in the same way from the leaves, rather than from the flowers, is used in Guadeloupe to check sudden hoarseness; when drunk it produces excessive sweating.

When this species grows to become a tree, it is said to be slender and round-topped, with a dense round crown, but usually it is described by collectors as a bushy shrub or small tree. In Panama it is said to be common. Its fruit is useful as a food for birds. On some of the specimens from Mt. Diablo (e.g., Shreve s. n. and the Perkins numbers) the leaves closely approach those of C. fruticosum in texture and venation and may represent a natural hybrid between the two species. Perkins 1320 contains one leaf on the Berlin specimen, among the 15 leaves on the sheet, which resembles greatly those of C. spinosum L., while the remainder are those of typical C. caudatum. Perkins 419 shows some fruticosum-like leaves, but nos. 1098 and 1112 are typical C. caudatum. Sometimes, as in Britton, Stevens, & Hess 2571 and Stevens 4752, the leaves are actually thick-coriaceous. In Harris 8874 and in Britton & Wilson 14542 only the obviously mature leaves are thick-coriaceous. Fawcett notes that the wood of this species is "a most useful timber in building, close-grained and very tough, used for mill rollers and frames, carriage wheels, &c."

Steyermark describes the leaves as firmly membranous, subcoriaceous, or coriaceous, rich-green or rich grass-green above, and pale-green or grass-green beneath. The leaves are sometimes very heavy and bright light-green, e.g., Shreve 443 from Jamaica and Steyermark 39327 from Guatemala. Macbride 2738 is notable in possessing a long furcate raceme. The Central American specimens have in general longer racemes and more herbaceous calyxes, which are of a lighter color in drying, as is splendidly exemplified by Gentle 61 and Macbride 2738. In Central America the species seems to be especially fond of the seashore as a habitat. Fendler 290 represents an especially broad-leaved form, whose leaf-blades are

regularly 5.2--6.9 cm. wide and are mostly emarginate at the apex, while in Harris 9825 they attain a length of 17.5 cm. and a width of 7.7 cm. and the petioles are to 2.4 cm. long. Ordinarily the petioles are only about 1 cm. long. Occasionally, as in Leonard 4317, 4372, and 4536, the midrib and secondaries and even some of the veinlets are deeply impressed above. The flowers are almost uniformly described as fragrant, except by Cooper, who states flatly that they have "no odor". The species has been widely confused with C. lucidum Cham. & Schlecht. and C. villosum Jacq. [= C. fruticosum var. villosum (Jacq.) O. E. Schulz]. Schulz includes "C. lucidum Cham." and C. chamissonis Walp. in the synonymy of C. caudatum; Fawcett and Roig also include C. lucidum. The latter, however, is a distinct Mexican species.

The corolla-lobes are usually reflexed when the plant is in full anthesis. The species is known to be cultivated in Panama, Cuba, Peru, Chile, and the Hawaiian Islands. According to Grey & Hubbard, List Pl. Bot. Gard. Atkins Instit. 56 (1933), it is cultivated at Cienfuegos, Las Villas, Cuba. It was collected by J. G. Jack at Buenos Aires, Cuba, in April, 1929. Raimondi says of his no. 12203 "Jardin botanico de Lima. Se cree indigena de Chanchamayo, Dep. Junín". His no. 12507 was collected at Pampa hermosa, Montaña de Pangoa, Junín, and may be the source collection for the seeds from which the cultivated Lima material was raised. This is a remarkable range extension for the species, if it is truly native in Junín and if the Peruvian plant is really C. caudatum. There is, however, doubt in my mind concerning both of these assertions. It was originally determined as "Loganiaceae?" The Peruvian specimen in the J. Jussieu herbarium was originally determined as "Citharexylum emarginatum Vahl" and as "Citharexylum emarginatum Vahl". A sheet of Sintenis 1370 at Leningrad has on it a specimen of Ocotea leucoxylon (Sw.) Mez, of the Lauraceae, instead of Citharexylum caudatum, and doubtless represents a case of transposed labels. Harris 9378 was originally misidentified as "Anona cherimolia Mill." The Herb. Osbeck s.n. at Stockholm, determined as Citharexylum caudatum, is a species of Inga, in the Mimosaceae. Andersson s.n. from Guam was originally misidentified as Gmelina asiatica L. and G. inermis Blanco. The Munich specimens of Sintenis 5351 are labeled "535" -- the last figure apparently having been omitted when the labels were made.

The illustrations in Plum., Pl. Amer., ed. Burm., pl. 157, fig. 2 (1758), labeled "C. caudatum", and in Jacq., Ic. Pl. Rar., ed. 2, 3: 501 (1793), as "C. erectum", actually are C. fruticosum L. Buch 1449 is a monstrosity (nos. 2, 3, and 4), with the calyx deeply split, the 4 lobes often unequal, the corolla slightly exceeding the calyx, the anthers 1.8 mm. long and substerile, and the pedicels elongate, 5--10 mm. long. The plant cultivated in Cuba and collected as C. F. Baker 23 was grown there from seeds sent from Belize, British Honduras. Baker says that the shrub has

decidedly ornamental "spikes" [racemes].

Vernacular and common names recorded for the species are "bird-seed", "bois carré", "bois guitarre", "canilla de venado", "cateicillo", "cigua", "citharexylum a fleurs en queue", "caffé marron", "collarete", "collarete", "dama", "fiddle wood", "fiddle-wood", "fidelle-wood", "guairo sando de costa", "guairo santo", "guairo santo de costa", "guayo blanco", "higuerillo", "juniper berry", "juniper-berry", "long-spiked fiddle-wood", "manglillo", "moco de pavo", "palo de dama", "palo de guitarra", "palo de guitarre", "palo guitarre", "penda", "pendola de sierra", "pénlula blanca", "perda", "pigeon-feed", "roble amauce", "roble amarillo", "roble blanco", "saugé doncella", "white fiddlewood", "white fiddle-wood", and "wild-cherry". Some of these names are also applied to other species; for instance, "canilla de venado", "guairo sando de costa", and "roble amarillo" apply also to C. fruticosum, "juniper-berry" and "white fiddle-wood" to C. spinosum, "fiddle-wood" to C. spinosum and to Petitia domingensis Jacq., "higuerillo" to C. fruticosum and to Vitex divaricata Sw., "penda" to C. fruticosum, C. fruticosum var. subvillosum Moldenke, C. fruticosum var. villosum (Jacq.) O. E. Schulz, C. spinosum, and Cornutia pyramidata L., and "white fiddlewood" to C. fruticosum, C. fruticosum var. brittonii Moldenke, C. fruticosum var. villosum, Vitex capitata Vahl, and Vitex compressa Turcz. "Moco de pavo" is applied also to Amaranthus cruentus L., in the Amaranthaceae, "guairo santo" to C. fruticosum and to Aegiphila elata Sw., "guayo blanco" to C. fruticosum, C. tristachyum Turcz., C. spinosum, and Banara roigii P. Wils. (Flacourtiaceae), "cateicillo" to Phyllanthus nobilis (L. f.) Muell.-Arg. (Euphorbiaceae), "bois carré" to C. spinosum, and "roble blanco" to C. fruticosum and Tabebuia angustata Britton (Bignoniaceae). Jäger records the name "caffé marron" from Haiti and was misled by this name into thinking that our plant is a species of Coffea (Rubiaceae).

Schulz's key to distinguish C. caudatum from the other West Indian species of the genus is worth repeating here:

1. Corolla 2--3 times as long as the calyx.
2. Leaf-blades widely reticulate-veined, very smooth; pedicels 2 mm. long during anthesis; pyrenes 1-celled....C. caudatum.
- 2a. Leaf-blades closely reticulate-veined, often pilose; pedicels 0.5--1.5 mm. long during anthesis; pyrenes 2-celled.
3. Pedicels 0.5--0.75 mm. long during anthesis.
4. Leaves small, 7--12 mm. long; racemes very short, about 6 mm. long.....C. microphyllum.
- 4a. Leaves larger, 3.5--14.5 cm. long; racemes much longer.
5. Leaf-blades oblanceolate, long-acuminate at the base; lateral veins prominent beneath.....C. bahamense.
- 5a. Leaf-blades more or less elliptic, short-acuminate at the base; lateral veins distinctly prominent beneath.
6. Lateral veins prominent only beneath; calyx plainly dentate; branchlets obtusely tetragonal.C. albicaule

- 6a. Lateral veins prominent on both surfaces; calyx very shortly dentate; branchlets sharply tetragonal.....C. fruticosum.
- 3a. Pedicels 1--1.5 mm. long during anthesis.
7. Corolla glabrous outside; calyx attenuate to the base.
8. Leaf-blades very densely reticulate-nervose.....C. spinosum.
- 8a. Leaf-blades widely reticulate.
9. Leaf-blades barbulate in the vein-axils beneath; corolla split to 1/3 its length.....C. tristachyum.
- 9a. Leaf-blades tomentose throughout beneath; corolla split to 1/5 its length.....C. urbanii.
- 7a. Corolla tomentose outside; calyx rounded at the base...C. pentandrum.
- 1a. Corolla 3 1/2 to 5 times as long as the calyx.
10. Calyx-rim truncate, merely tuberculate-apiculate by the prolongation of the ribs of the calyx-tube; corolla 3 1/2 times as long as the calyx.....C. discolor.
- 10a. Calyx-rim very shortly 5-dentate; corolla 4 or 5 times as long as the calyx.....C. longiflorum.

Actually, I regard C. bahamense as a mere form of C. fruticosum var. villosum and C. urbanii as a form of C. tristachyum. There seem to be too many intermediate specimens to justify the separation of these two forms nomenclaturally. The Perkins 419 and 1320, distributed as C. caudatum, appear to represent natural hybrids -- the former with C. fruticosum and the latter with C. spinosum, hereinafter cited under xC. jamaicense Moldenke and xC. perkinsi Moldenke respectively.

In all, 656 herbarium specimens, including the type and the type collections of all the synonyms, and 24 mounted photographs have been examined.

Citations: MEXICO: Chiapas: Matuda 3771 (F--1028096, Mh, N), 3776 (F--1028092, Mh, N). Tabasco: Matuda 3066 (F--1026500, Me, Mh, N). Veracruz: Botteri s.n. [Orizaba] (G, W--771909, in part). GUATEMALA: Izabal: C. C. Deam 64 (G), 69 (G); Kellerman 4755 (W-575427); P. C. Standley 72151 (F--991244, N), 73112 (F--990833); Steyermark 38920 (F--1059814), 39364 (F--1051021), 39827 (F--1060103). BRITISH HONDURAS: H. H. Bartlett 11220 (Mi), 11337 (F-662516, F--662517, K, Mi, Mi, Mi, Mi, Mi, N, W--1587509), 11796a (Mi); Gentle 1 (F--665455, Mi), 61 (F--663960, I, Mi, N, S), 2268 (Dp--28975, F--944998, Mh, Mi, N), 2741 (Mh, Mi, Mi, N); Johnson s.n. [Belize] (W--429966); Kinloch 196 (F--675914); C. L. Lundell 1873 (Au, F--685348, Me, Mi, Mi), 4214 (Mi, N), 4215 (F--689430, Me, Mi, S), 6690 (Au, F--894318, Mi, Mi, N); O'Neill 8736 (I, Mi); Peck 102 (G); Record 14 (F--659152); Schipp 268 (A, B, Bm, Ca--396490, Cb, Cb, E--988625, F--713229, G, J, K, Mi, N, S, W--1494697); J. D. Smith 41 (W--57331, W--1323188), s. n. [Belize, 1889] (F--577224). HONDURAS: Atlantida: Mitchell 9

(F--580541, G); P. C. Standley 53052 (A, F--582278, N--photo, W--1407482, Z--photo), 54230 (A, F--584127, W--1408184), 56873 (A, F--581960, W--1409447); Yuncker 4656 (Dp, E--1086845, F--749638, Mi). Cortés Hjalmarsson 39 (S). BAY ISLANDS: G. F. Gaumer 141 (K). COSTA RICA: Alajuela: Standley & Torres 47875 (W--1305322). Cartago: Standley & Torres 50995 (W--1306572). Limón: H. Pittier 3642 (N, W--678700); E. Wall s.n. [Port Limón, 16/2/27] (Ew). PANAMA: Bocas del Toro: G. P. Cooper 561 (F--579645, S, W--1491507, Y--12194); Cooper & Slater 139 (F--572712, W--1316770, Y--10485); Hart C².117 (K); Wedel 2469 (N), 2812 (N). Canal Zone: P. H. Allen 1836 (F--1004884); Bailey & Bailey 682 (Ba, F--703-180); Celestine 73 (W--716330); Cowell 195 (N); Epplesheimer s. n. (F--285368); Fendler 290 (E--119049, E--119050, G, K, N--photo, W--57338, Z--photo), 290b (G, K, K, W--57339); J. W. Gillespie P.8 (Du--159024, S), s.n. [Feb. 19, 1926] (Du--159031); Hayes 568 (Bm, K); Hunter & Allen 705 (E--1121312), 720 (E--1121310); Killip 12105 (W--1167240); Lehmann K.287 (K); Macbride 2738 (F--521254, W--1167983); Maxon 6775 (N, W--1180508); Paul 389 (N); Piper 5361 (N, W--1167564), 5562 (W--1166115); H. Pittier 2631 (Bm, F--575525, G, N, W--676780); Rowlee & Rowlee 397 (W--1036453); Seemann 522 (Bm); P. C. Standley 25178 (A, W--216327), 26394 (A, W--1216980), 31195 (W--1219716); F. L. Stevens 171 (Ur), 979 (Ur), 1039 (Ur); Gene White 161 (F--1004847), 163 (F--1004849); P. White 102 (F--1004865). Coclé: R. S. Williams 373 (N, W--678085). Colón: P. H. Allen 3597 (N, N, S); Debeaux 45 (V), 51 (P, P); Hayes 714 (T), 889 (T); Kuntze 1820 (N); H. Pittier 3942 (G, N, W--679024); P. C. Standley 30163 (W--1219113). Panamá: N. J. Andersson s.n. [Apr. 1852] (S); Gervais 151 (W--716542); J. F. Macbride 2738 (N); P. C. Standley 25916 (W--1216723), 27742 (W--1217743), 28171 (W--1217993), 29754 (N--photo, W--1218882, Z--photo), 29781 (W--1218903), 31882 (W--1225038). Province undetermined: Duchassaing s.n. [1850] (L), s.n. [1851] (P); Dunlap 528 (F--689801, W--1405720); Maurice 885 [Boqueté] (W--1791135); Piper 5333 (W--1165956); Seemann 522 (K). PEARL ISLANDS: San José Island: C. O. Erlanson 23 (N). BAHAMAS: Northrop & Northrop 571 (A, B, C, F--130666, G, K, X). CUBA: Havana: C. F. Baker 28 (Cb); Baker & Abarca 4322 (A, B, E--119111, Es, N, Po--64672, W--523745); Cremata 7504 (Es); Ekman 18317 (N, S); Fortún 6946 (Es); O'Donovan 5204, in part (Po--63512); Roig 1281 (Es), 3585 (Es), 3730 (Es), 6323 (Es); Serre s.n. [1909] (Bg); Shafer 472 (Cm, Es, N). Las Villas: Alain 6465 (Z); C. F. Baker 2508 (B, Es, N, Po--63515), 4979 (B, Ca--139935, Es, N, Po--63517); Britton & Wilson 5454 (N); Ekman 13902 (B, S), 18487 (B, S); R. A. Howard 5204 (N), 5228 (N, N); J. G. Jack 6874 (A, N, N), 7243 (A, B, Ba, F--702521, N, W--1478175), 7255 (A, N, N, N--photo, P, W--1476546, Z--photo),

7346 (D--777439), 7436 (A, A, N, N, S, W--1478085, W--1556130);
León 6675 (Ha, N), 6705 (Ha, N), 13954 (Ha, N); León & Clément
6507 (N), 6587 (N), 6705 (Ha, N); Luna 32 (N). Matanzas: Comas s.
n. [Herb. Roig 3612] (Es). Oriente: Acuña 10206 (Es); Alain 252
(Ha); Clément palo 36 (Sc); Edmund 68 (Ha); Ekman 1616 (N, S),
6032 (B, S), 6726 (S), 9800 (S), 13826 (S), 14238 (S), 17750 (S);
León 9942 (Ha, N), 10909 (Ha, N); León, Clément, & Roca 9942 (N);
Linden 1789 (B, Bm, Bm, Br, Cb, Cb, Cb, F--686810, K, N, N--photo,
P, S--photo, V--285072, X, Z--photo); Underwood & Earle 712 (N);
C. Wright 435 [1856--7] (B, D--611743, G, K, X), 435 [1859, 1860]
(E--119083), 436 [1856--7] (D--611743, G, N, X), 436 [Jan.--Jul.
1859] (G), 436 [1860] (K, L, Os, P, S), 436 [Herb. Sauvalle 1768]
(Hv, Hv, Hv), 1359 (Br, Cb, Cb, E--119082, G, K, L, N, N, Os, P,
S, V--211827, X). Pinar del Río: Alain 149 (Hk), 492 (Z); L. H.
Bailey 12160 (Ba); Britton & Britton 7533 (F--285621, N, W--696-
844); Britton, Earle, & Gager 6732 (N); Earle 747 (F--285878, N);
Ekman 13826 (N); Ganganelli s.n. [Herb. Roig 2063] (Es); León
5153 (N), 12622 (Ha, N), 13843 (Ha, N); León, Victorin, & Alain
19662 (Ha, N); Moldenke & Moldenke 19871 (Es, Lg, Mg, N, Ot, Sm);
O'Donovan 5204, in part (B, N); Roig 1087 (Es); Rutten-Pekelhar-
ing 468 (Ut), 474 (Ut); Shafer 380 (N), 11771 (N, W--699437).
Province undetermined: Herb. Sauvalle s.n. (Hv); C. Wright 116
[Herb. Sauvalle 1766, in part] (Hv), 1356 [no data] (B, Pa, T,
W--57323), 1356 [Herb. Sauvalle 1770] (Hv), 3183 [Herb. Sauvalle
1769, in part] (B, B, E--119071, G, Hv, N, N, Os, Pa, S, S, W--
57324, W--57325). ISLA DE PINOS: Britton & Wilson 14542 (Cm, F--
459762, N, W--793445), 14856 (N); Cremata s.n. [Herb. Roig 2022]
(Es); Curtiss 515 (A, B, Bm, Cb, Cm, E--119072, Ed, Ed, Es, F--
165422, G, It, K, L, Le, Mu--3993, N, P, Vt, W--522132), s.n.
[Nueva Girena] (N); Ekman 12120 (S); O. E. Jennings 167 (Cm, N);
Killip 42904 (Le), 43872 (N); León 17880 (Ha, N). JAMAICA: R. C.
Alexander s.n. [1850] (A, D--612059, K, Ol), s.n. [Herb. Griseb.]
(B), s.n. [Moneague] (K, N, W--1048203); Balbis s.n. (B); Ber-
tero 169 (B, E--photo, N--photo, S--photo, W--photo, Z--photo),
s.n. (Dc); N. L. Britton 106 (N, N), 490 (N), 1553 (N); Browne
s.n. [Herb. Linnaeus G.777, S.5] (N--photo of type, S--photo of
type, Z--photo of type); Campbell 5722 (B); Crawford 693 (D--
539327, N); Fawcett 6783 (F--145925); W. Harris 6783 (N), 8546
(A, B, B, Bm, Ca--522699, N), 8677 (B, Bm, D--524400, F--174302,
Le, N, W--655745), 8874 (B, Bm, Bm, N), 9378 (B, Bm, F--212295,
N, W--524698), 9825 (B, Bm, F--250368, G, K, N, P, W--848513),
11065 (Bm, N, W--699857); Harris & Lawrence C.15127 (J), C.15409
(N, W--794095), C.15410 (Ur), C.15508a (A); Hart 577 (W--
1323225); Jerman s.n. [Bot. Garden] (Ca--323441); March 1447
(K), 1780 (K), s.n. [Jam.] (G, L); Maxon 8657 (S, W--1182242);

Maxon & Killip 1369 (A, Bm, F--500842, G, K, Os, P, Ur, W--1046477); McNab 35 (Ed), s.n. (B, Ed); Perkins 1098 (B), 1112 (B); Rehder s.n. [Blue Mtns.] (A, A, A); Shreve 443 (Fs), 444 (Fs), 532 (Fs), s.n. [Mt. Diablo] (N), s.n. [near Cinchona] (N, N); Swartz s.n. (Bm); W. T. Thompson 6783 (B); Tussac s.n. (Dc); W. Wright s.n. [1778] (S), s.n. (Bm); Wullschlägel 973 (Mu--747). HISPANIOLA: Haiti: W. Buch 500 (B), 449 (B), 1626 (B); Ekman H.1248 (B, S, W--1410257); Jäger 44 (B, L); E. C. Leonard 434 (Bm), 4317 (F--505921, G, W--1076774), 4372 (N, W--1076838), 4536 (B, N, W--1077027), 9148 (E--939433, F--574251, N, W--1300400), 9546 (Ca--318037, G, W--1300651); Picarda 1515 (B, S). Dominican Republic: Nectoux s.n. [St. Dominique] (Ed, P); Prenleloup 431 (B); L. C. Richard s.n. [S. D.] (P). PUERTO RICO: Britton, Britton, & Brown 6565 (Cb, N); Britton & Hess 2275 (F--414974, G, Gg--31072, N, S, W--759898); Britton, Metz, & Chardon 6887 (N, W--1145460); Britton, Stevens, & Hess 2571 (E--718783, F--414595, N, W--758875); Eggers 5351 (Cp, E--119098, N); I. E. Gregory 76 (N); Kramer 33 (Y--1345); Otero 729 (Bt--58765, N, N); Shafer 3379 (F--451647, N, W--792468); Sintenis 1287 (B, Bm, G, K, Lu, V--144, W--403462), 1370 (B, Cb, Le), 1386 (B, Bm, G, K, L, Lu, V--143, W--403461), 2889 (B, S), 5351 (B, Cb, F--80073, K, Lu, Mu--3760, Mu, P, X); F. L. Stevens 4752 (N), 8433 (N); Stevens & Hess 2275 (N). MARTINIQUE: Collector undesignated s.n. (V--220004). WEST INDIES: Island undesignated: Herb. Jacquin f. s.n. (V); Riedlé s.n. (P); Swartz s.n. [Ind. occid.] (S). COLOMBIA: Antioquia: Haught 4889 (N). PERU: Junín: Raimondi 12507 (B, N--photo, Z--photo). Department undetermined: Herb. J. Jussieu s.n. [Herb. A. L. Jussieu 5087] (P). MARIANNA ISLANDS: Guam: N. J. Andersson s.n. (S). CULTIVATED: Cuba: C. F. Baker 23 (A, B1--42208, Bz--18722, Ca--123973, E--119068, Ed, Ed, Es, G, G, Io--45339, K, K, L, L, Ms, N, N--photo, Po--253380, Po--253381, W--618031, X, Z--photo); Moldenke & Moldenke 19892 (Es, Lg, N, Sm). Panama: Crawford 397 (D--539015, N); H. N. Moldenke 19801 (N). Peru: Raimondi 11906 (B), 12203 (B). Chile: Cuming 287 (V). Hawaiian Islands: Degener & Murashige 20075 (N).

CITHAREXYLUM CHARTACEUM Moldenke in Fedde, Repert. Sp. Nov. 37: 219. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 219. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 22, 23, & 36. 1939; Moldenke, Brief Course Syst. Bot., ed. 2, 20. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33, 34, 71, & 88. 1942; Moldenke, Alph. List Cit. 1: 180, 276, 303, & 319. 1946; Moldenke, Brief Course Syst. Bot. Gard. 21. 1947; Moldenke, Alph. List Cit. 2: 420 & 436 (1948) and 4: 1057, 1067, & 1113. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 69, 71, 157, & 179. 1949.

Shrub or tree, to 8 m. tall; branchlets rather slender, gray, acutely tetragonal, glabrate, with the angles margined; twigs and young shoots brown, acutely tetragonal and margined, glabrous; nodes obscurely or not at all annulate; principal internodes 1--5 cm. long; leaf-scars relatively small and inconspicuous except at the apex of the branchlets, where they subtend twigs or young shoots and where they are borne on large, stout, corky sterigmata to 4 mm. long and wide; leaves decussate-opposite; petioles very slender, 2--13 mm. long, glabrous; leaf-blades membranous or thin-chartaceous, dark-green and shiny above, lighter beneath, oblong-elliptic or broadly elliptic to subobovate (the smaller ones often subrotund), 5--15.5 cm. long, 3.2--7.2 cm. wide, acute or short-acuminate (rarely emarginate) at the apex, entire, acute or cuneate at the base, bearing 1 or 2 very small and usually inconspicuous disk-like glands on the blade near its base or not glanduliferous, glabrous above, finely puberulent beneath, becoming completely glabrous in age; midrib very slender, plane or very slightly impressed above, prominulous or almost plane beneath; secondaries very slender, 5--8 pairs, arcuate-ascending, anastomosing near the margins in many arches or not anastomosing, prominulous or plane beneath; veinlet reticulation very abundant, extremely fine and delicate, conspicuous but not at all prominulous beneath; racemes terminal and terminating axillary twigs, erect or pendent, mostly nutant, 9.5--18 cm. long, about 1.5 cm. wide, rather loosely many-flowered; peduncles very slender, 1.5--3 cm. long, glabrate or very obscurely puberulent; rachis very slender, glabrate or obscurely puberulent; bractlets often 1 pair at the base or middle of the peduncle, linear, to 4 mm. long; prophylla setaceous, about 1 mm. long, obscure; pedicels to 1 mm. long or obsolete; calyx campanulate, light-textured and translucent, about 3.1 mm. long and 2.8 mm. wide, slightly venose, glabrous, its rim shortly 5-toothed, the teeth very short; corolla hypocrateriform, its tube about 4.4 mm. long, about 1.8 mm. wide at the base, ampliate to 3.3 mm. at the apex, glabrous outside, densely long-pilose in the throat within, its limb 5-lobed, the lobes oblong-obovate, about 3.2 mm. long and 2.3 mm. wide, rounded at the apex, pubescent on the inner surface; fertile stamens 4, equal, included, inserted about 2 mm. below the mouth of the corolla-tube; filaments about 0.7 mm. long; anthers ovate, about 1 mm. long and 0.5 mm. wide at the base; staminode small, filiform, about 0.2 mm. long; pistil included; style about 1.5 mm. long, glabrous; stigma ampliate, about 0.5 mm. wide, very shortly 2-lobed; ovary subglobose, about 0.8 mm. long and wide, glabrous; fruiting-calyx and fruit not known.

The type of this species was collected by August Weberbauer (no. 7633) in deciduous bushwood in the mountains east of Hacienda Chicama, province of Tumbes, Tumbes, Peru, between February 19 and 24, 1927, at an altitude of 1000 meters, and is deposited in the herbarium of the Chicago Museum of Natural History. The collector describes the flowers as brownish-yellow or yellowish-white and the filaments as white. It has also been collected in

anthesis in January. The species has hitherto been confused with C. molle H.B.K. and C. quitense Spreng. Its extremely thin leaf-blades, their very delicate but conspicuous and yet not in the least elevated venation on the lower leaf-surface, and the woolly corolla-throat characterize it well. In some of these respects it reminds one of C. discolor Turcz.

The Herb. Bernhardt specimen at St. Louis is placed here tentatively. It is taken from a cultivated plant and disagrees somewhat from the ordinary characters of the species, which character combination is remarkably constant in all the other specimens cited and renders the species most easy to identify. The Bernhardt specimen has more conspicuously pubescent or strigillose lower leaf-surfaces and puberulent petioles and young shoots.

Thirty-two herbarium specimens, including the type, and 7 mounted photographs have been examined.

Citations: ECUADOR: Manabi: Eggers 15562 (B, Bm, Cp, F--143454, K, K, L, Le, Lu, Mu--1845, N, N, N--photo, P, S, W--1323220, Z--photo). PERU: Tumbes: Weberbauer 7633 (B--isotype, B-isotype, B--photo of type, Cb--isotype, F--571766--type, G--isotype, K--isotype, K--photo of type, N--isotype, N--photo of type, S--isotype, S--photo of type, W--1495252--isotype, Z--photo of type), 7678 (B, Cb, F--571821, G, K, S, W--1495253). CULTIVATED: Locality undetermined: Herb. Bernhardt s.n. (E--119093).

CITHAREXYLUM COOPERI Standl., Trop. Woods 10: 50. 1927.

Literature: Standl., Trop. Woods 10: 50. 1927; Hill, Ind. Kew. Suppl. 8: 53. 1933; Standl., Field Mus. Publ. Bot. 18: 1000. 1938; Moldenke, Alph. List Common Names 9 & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 17. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 22, 23, & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 123, 170, 319, & 320. 1946; Moldenke, Phytologia 2: 331. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 54. 1948; Moldenke, Alph. List Cit. 2: 333, 347, & 390 (1948), 3: 757, 821, 940, & 978 (1949), and 4: 1031, 1045, 1048, 1053, 1055, 1067, 1072, & 1186. 1949; Moldenke, Phytologia 3: 133. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 39, 40, & 179. 1949.

Shrub or small tree, to 8 m. tall, with spreading crown; stem to 15 cm. in diameter; branchlets and twigs rather slender, acutely tetragonal, the young shoots light-brown, often 4-margined and more or less deeply sulcate on two opposite sides, medullose, short-pilose at first with spreading hairs, later glabrate; nodes not annulate; principal internodes 2.5--9.5 cm. long; leaf-scars borne on conspicuous, stout, and corky sterigmata; leaves decussate-opposite; petioles rather stoutish, 2--15 mm. long, deeply canaliculate above, minutely puberulent or glabrate; leaf-blades subcoriaceous (chartaceous or membranous when immature), pale, gray-green and shiny above, usually brighter green beneath, ovate or oblong to elliptic or oblong-elliptic, occasionally subovoid, 4, 8--20 cm. long, 2.3--8 cm. wide, acute or short-acuminate at the apex, entire, acute or short-cuneate

and decurrent at the base, bearing a pair of very small discoid glands on the blade at the base (plainly visible on immature leaves, obscure on or absent from mature leaves), glabrous or subglabrous above, pubescent or densely velutinous-pilose along the midrib and larger venation and minutely puberulous on the lamina beneath; midrib rather stout, deeply impressed above (on mature leaves), very prominent beneath; secondaries stoutish, 5--7 pairs and arcuate-ascending, usually not anastomosing, deeply impressed above (on mature leaves), very prominent beneath; veinlet-reticulation sparse, more or less impressed or obscure above, prominent beneath; racemes numerous, erect, paniculate, terminal and terminating short axillary twigs, 2--9 cm. long, often bearing 1 or 2 pairs of branches in the axils of the branchlets at the base, each branch 1--1.5 cm. (or less) wide, densely many-flowered; peduncles slender, 1.5--3.5 cm. long, short-pubescent or puberulent with canescent hairs or subglabrous, usually bearing 1--5 nodes at each of which is borne a pair of linear bractlets; rachis similar to the peduncle, mostly short-pilose; pedicels filiform, 1.2--2 mm. long or less, pubescent or puberulent; bractlets linear, paired, to 5 mm. long, short-pubescent or puberulent; prophylla setaceous, to 1 mm. long; flowers fragrant; calyx narrowly campanulate, about 4 mm. long, sparsely hirtellous; corolla white, its tube about 2.5 mm. long, the lobes about 2 mm. long, obtuse at the apex, minutely puberulent; fruiting-calyx much indurated and incrassate, about 4 mm. long and 6.5 mm. wide, deeply 5-lobed, prominently striate, the lobes triangular, acute at the apex, 2.5--3 mm. long, to 3 mm. wide at the base; fruit orange, globose, about 8 mm. long.

The type of this species was collected by George Proctor Cooper -- in whose honor it is named -- and G. M. Slater (no. 34) in the Changuinola Valley, Bocas del Toro, Panama, in 1927, and is deposited in the United States National Herbarium at Washington. Cooper describes it as a tree 25 feet tall, with a trunk 6 inches in diameter, and with "a full spreading crown". He also describes the flowers as white and pleasantly odorous, and records the common names "corrimiente" and "wild-lime". The former of these names is also applied to C. viride Moldenke. In its Panamanian habitat, he says, it is a small shrubby tree of no commercial importance, but "the hard dense wood seems to have possibilities for turnery and it is known to be durable and very strong."

The species is well marked by its regularly impressed midrib and secondaries on the upper surface of the mature leaves, its subcoriaceous grayish-green leaf-blades, and its usually compound racemes. It is said to inhabit plains, clearings, and cacao orchards, ascending to 640 meters altitude. It has been collected in anthesis from January to March and in June, and in fruit in August. In herbaria it has been confused with C. integerrimum (Kuntze) Moldenke. Thirty-three herbarium specimens, including the type, and 9 mounted photographs have been examined.

Citations: COSTA RICA: Guanacaste: Brenes 12322 [211] (N). San José: Skutch 4315 (F--973965, N, S, W--1644953). Province unde-

terminated: H. Pittier s.n. [Herb. Instit. Physico-geogr. Nat. Costaric. 16071] (B, B, B, B, B, W--578476, W--1080205). PANAMA: Bocas del Toro: G. P. Cooper 384 (F--579254, F--579523, K, N, N, N, N--photo, W--1521573, W--1521580, Y--11975y, Z--photo); Cooper & Slater 34 (A--isotype, B--photo of type, F--572718--isotype, G--isotype, K--photo of type, N--photo of type, N--photo of isotype, S--photo of type, W--1269807--type, W--1316764--isotype, Y--10134--isotype, Y--isotype, Z--photo of type, Z--photo of isotype); Dunlap 42 (F--689804); Stork 42 (Mi, W--1166830). Chiriqui: P. H. Allen 3661 (N, N).

CITHAREXYLUM COSTARICENSE Moldenke in Fedde, Repert. Sp. Nov. 37: 219--220. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 219--220. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 17. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 22 & 88. 1942; Moldenke, Alph. List Cit. 1: 301 & 320 (1946), 2: 344, 390, 419, & 436 (1948), 3: 945 (1949), and 4: 999 & 1025. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 39 & 179. 1949.

Shrub or tree, to 16 m. tall; trunk to 60 cm. wide at the base; bark light-brown, with regular and shallow narrow striations; cambium cream-colored with salmon-buff streaks; branchlets rather stout, more or less acutely tetragonal, dark-brown or blackish in drying, lenticellate, medullose, very minutely puberulent or glabrate; nodes annulate; principal internodes 1.5--4.7 cm. long; leaf-scars large, borne on stout corky sterigmata about 2 mm. long; leaves decussate-opposite or the uppermost approximate on young shoots; petioles stout, 10--13 mm. long, glabrous; leaf-blades firmly chartaceous, very bright-green and shiny on both surfaces, broadly oblong-elliptic or ovoid, 10.5--21.5 cm. long, 7.2--10.3 cm. wide, short-acuminate at the apex (occasionally only acute or rounded on stunted leaves), entire, beautifully rounded at the base, apparently not glanduliferous, perfectly glabrous on both surfaces or slightly scabrous because of a faint and finely raised vein reticulum on the upper surface; midrib stout, impressed above, prominent beneath; secondaries stoutish, 7--9 pairs, arcuate-ascending, rather obscurely anastomosing near the margins, impressed above, prominent beneath; veinlet reticulation very numerous and fine, equally prominulous and conspicuous on both surfaces; racemes terminal, compound, to 40 cm. long, the central branch 14--20 cm. long and to 1.5 cm. wide, the lateral branches about 2 pairs, opposite or approximate, each branch 8--19 cm. long, spreading, often nutant, all rather densely many-flowered; peduncles merging into the apex of the branchlets, similar to it in color and puberulence, 4--4.5 cm. long, bearing usually 1 node, which, in turn, bears a pair of small linear caducous bractlets; rachis stoutish, angulate-striate, brownish, glabrate or very obscurely puberulent; pedicels filiform, to 1 mm. long or obsolete; prophylla setaceous, to 1 mm. long; calyx campanulate, slightly curvate

and asymmetrically borne on the pedicel, about 3.6 mm. long and 3.1 mm. wide, 5-costate, glabrous, its rim truncate and entire; corolla white, hypocrateriform, slightly curvate, its tube broadly cylindrical, about 3.6 mm. long, about 2 mm. wide at the base, ampliate to 3.3 mm. at the apex, glabrate outside, densely pubescent in the throat within, its limb 5-parted, the lobes subequal, obovate-lingulate, about 2.1 mm. long and 1.8 mm. wide, rounded at the apex, pubescent; stamens 4, equaling the corolla-tube, didynamous, "forming a raised corona", 2 inserted about 1 mm. and the other two about 1.4 mm. below the mouth of the corolla-tube; filaments about 0.5 mm. long, more or less flattened; anthers o-vate, about 0.7 mm. long and 0.3 mm. wide; pistil included; style about 1.6 mm. long, glabrous; stigma very shortly 2-lobed, the lobes about 0.6 mm. long, not fimbriate; ovary oblong, about 1.5 mm. long and wide, glabrous, 4-celled; fruiting-calyx and fruit not known.

The type of this species was collected by Adolfo Tonduz (no. 7369) in pastures at La Palma, San José, Costa Rica, at an altitude of 1460 meters, on September 19, 1898, and is deposited in the herbarium of the Chicago Natural History Museum. The species ascends to 2000 m. in the Caribbean cloud forest of Alajuela.

I am regarding the inflorescences here as compound because the separate lateral racemes do not arise from leaf-bearing nodes. The peduncle here and in all members of this genus is regarded as that part of the twig's apex which does not bear leaves and extends up to the lowest flower or lateral raceme. It may have one or more nodes like the branchlets, but these nodes either bear only a dormant bud and no foliar organs or else bear small bractlets entirely different in size and shape from the true leaves. In some cases the apparent peduncle here is abbreviated to 5 mm. and scattered lateral racemes are borne at or between the nodes of what is actually the much longer peduncle.

The species has been confused in the past with C. macrophyllum Poir. and C. reticulatum H.B.K. It is related to C. cooperi, which also has the impressed midrib and secondaries. In C. cooperi, however, the racemes are simple or bear only 2 very short branches at their base, the leaf-blades are subcoriaceous, gray-green, acute or short-cuneate at the base, mostly pubescent or puberulent beneath, and with the veinlet reticulation very obscure. In C. costaricense the racemes are always conspicuously compound, with the lateral branches usually 2 pairs and almost as long as the central one, the leaf-blades chartaceous, very bright-green on both surfaces, beautifully rounded at the base, perfectly glabrous on both surfaces, and with the veinlet reticulation very abundant and equally conspicuous and prominent even to the finest divisions on both surfaces. Twenty-one herbarium specimens, including the type, and 7 mounted photographs have been examined.

Citations: COSTA RICA: Alajuela: A. Smith H.467 (F--919549, N). San José: Tonduz 7369 [Herb. Instit. Physico-geogr. Nat. Costaric. 12557] (B--isotype, B--isotype, B--isotype, B--photo

of type, Bm--isotype, C--isotype, Cb--isotype, Cb--isotype, E--119055--isotype, F--76897--isotype, F--576597--type, G--isotype, K--isotype, K--isotype, K--photo of type, Mu--3827--isotype, N--isotype, N--photo of type, N--photo of isotype, Qu--isotype, S--photo of type, W--354353--isotype, W--1323216--isotype, X--isotype, X--isotype, Z--photo of type, Z--photo of isotype).

CITHAREXYLUM CRASSIFOLIUM Greerm. in Donn. Sm., Enum. Pl. Guat.

7: 70, hyponym (1905); Field Columb. Mus. Publ. Bot. 2: 186. 1907.

Synonymy: Citharexylum cinereum Donn. Sm. ex Greerm., Field Columb. Mus. Publ. Bot. 2: 186, in syn. 1907 [not Citharexylon cinereum L., 1851, nor Spreng., 1851, nor Citharexylum cinereum L., 1763, nor Sessé & Moc., 1894, nor Jacq., 1909, nor Cytharexylon cinereum L., 1934].

Literature: Donn. Sm., Enum. Pl. Guat. 6: 33 (1903) and 7: 70. 1905; Greerm., Field Columb. Mus. Publ. Bot. 2: 186. 1907; Prain, Ind. Kew. Suppl. 4: 49. 1913; Moldenke, Geogr. Distrib. Avicenn. 15. 1939; Moldenke, Alph. List Invalid Names 58. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19 & 88. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; Moldenke, Alph. List Cit. 2: 351 (1948), 3: 947 & 973 (1949), and 4: 1012 & 1057. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 34 & 179. 1949.

Shrub or tree, to 13 m. tall; stems terete, covered with grayish bark; branchlets rather stoutish, obtusely tetragonal or subtetragonal, dark-gray or brownish, striate, the younger ones densely but very shortly pubescent or puberulent with dark-brown hairs, compressed at the nodes; nodes not noticeably annulate; principal internodes 1.5--4.2 cm. long; leaf-scars large, borne on large, thick, corky, ascending stericmata 1--3 mm. long and 3 mm. wide; leaves decussate-opposite; petioles very stout, 5--10 mm. long, shallowly canaliculate with incurved margins above, 2--5 mm. thick, densely puberulent with extremely short dark-brown hairs, somewhat wrinkled in drying; leaf-blades very thick leathery-coriaceous or firmly subcoriaceous, dark- or deep-green to gray-green and shiny (rarely dull-green) above, paler or somewhat brighter green or light grass-green beneath, oblong or oblong-lanceolate to elliptic, 4.2--13 cm. long, 1.9--5 cm. wide, acute or obtuse to an emarginate or retuse apex, entire and slightly revolute along the margins, acute at the base and narrowed into the petiole, not noticeably glanduliferous, very finely puberulent-scabrellous above with extremely minute hairs on elevated punctae, densely short-pubescent beneath; midrib stout, plane above (or slightly impressed toward the apex), very prominent beneath; secondaries rather stoutish, 5--7 pairs, mostly very irregularly disposed, very prominent beneath, arcuate-ascending, irregularly anastomosing near the margins; veinlet reticulation abundant, mostly conspicuous on both surfaces, very decidedly prominent beneath; racemes solitary or several and paniculately disposed, terminal or terminating short axillary twigs, nodding during anthesis, erect in fruit, 7--10 cm.

long, about 1 cm. wide, rather sparsely many-flowered; peduncles slender, 2--3.6 cm. long, densely puberulent with dark-brown antrorse hairs or short-hirsute, often bearing 1 or 2 pairs of bractlets; rachis similar to the peduncle in texture and pubescence; pedicels filiform, to 1 mm. long or less, densely puberulent; bractlets few, paired, linear, to 7 mm. long, densely short-pubescent or puberulent, sometimes unequally paired, somewhat canescent; prophylla setaceous or triangular, acute at the apex, to 1 mm. long, about equaling the pedicels, densely short-pubescent; flowers scented, 4--5 mm. long during anthesis; calyx pale-green, narrowly campanulate, 2--2.5 mm. long, 5-angled in cross-section, minutely pubescent on the outer surface, its rim shallowly sinuate; corolla white, tubular-infundibular, about twice as long as the calyx, its tube glabrous outside, pubescent (especially in the throat) within, the lobes subequal, ovate-rotund, 1--1.5 mm. long and wide, pubescent on both surfaces; perfect stamens 4, the fifth reduced to a minute staminode; style glabrous; ovary glabrous; fruit orange, subglobose, about 1 cm. long and wide.

The type of this species was collected by Hans von Türckheim (no. 1308) -- often cited as J. D. Smith 1308 -- in a woods at Santa Rosa, Baja Verapaz, Guatemala, at an altitude of 1520 m., in July, 1887, and is deposited in the United States National Herbarium at Washington. It has been collected at altitudes of 1500 to 2600 m., in anthesis in January and October, and in fruit in December and January. It is said to inhabit dry slopes, forests, and ravines. It has been confused in herbaria with C. donnell-smithii Greerm. and with C. cinereum L. [= C. fruticosum L.]. It is easily distinguished, however, by the fact that its leaf-blades are thicker and more leathery in texture, dull-green, and not conspicuously reticulate-veined above, and the calyx is smaller. Eight herbarium specimens, including the types of all the names involved, and 5 mounted photographs have been examined.

Citations: MEXICO: Chiapas: Langman 3758 (W--2022087). GUATEMALA: Baja Verapaz: Türckheim 1308 (B--photo of type, K--photo of type, N--isotype, N--photo of type, S--photo of type, W--1323194--type, Z--photo of type). Zacapa: Steyermark 29789 (F--1040958), 42840 (N), 42845 (Ew, N), 43219 (N).

CITHAREXYLUM DAWEI Moldenke in Fedde, Repert. Sp. Nov. 37: 220--221. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 220--221. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 19 & 20. 1939; Moldenke, Alph. List Common Names 2. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 31, 32, & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 145 (1946) and 2: 603. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 55. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 59, 62, & 179. 1949; Moldenke, Alph. List Cit. 4: 1062. 1949.

Shrub or tree; branchlets rather slender or medium, very medullose, acutely tetragonal, on young shoots often decussately 4-margined, dark-brown, striate, glabrous, shiny; twigs slender, acutely tetragonal, usually lightly strigillose-pubescent; nodes annulate; principal internodes 0.6--6.8 cm. long; leaf-scars rather small, lunate or circular, on larger branchlets borne on very corky ascending sterigmata, 1--3 mm. long and 2--3 mm. wide; leaves decussate-opposite; petioles very slender, 4--17 mm. long, densely short-pubescent or glabrate, canaliculate above; leaf-blades membranous when immature, chartaceous when mature, dark-green and shiny above, somewhat lighter beneath, ovate-elliptic or broadly elliptic, mostly more or less falcate, 2.3--11 cm. long, 1.5--5 cm. wide, very lightly puberulent-strigillose above when immature, becoming glabrous in age, densely short-pubescent beneath, acute or short-acuminate at the apex, abruptly acute or attenuate-acuminate at the base, bearing a pair of small elongate glands at the base, entire or with a few coarse, broadly triangular, acute or obtuse, antrorse teeth along the margins to the middle; midrib comparatively stoutish, mostly short-pubescent above, prominent beneath; secondaries slender, 5--10 pairs, often indistinct, arcuate-ascending, anastomosing at the margins; veinlet reticulation often obscure; racemes terminal, terminating greatly abbreviated axillary twigs, or actually axillary, mostly erect, 4--11 cm. long, 1.2--2 cm. wide, rather densely many-flowered, occasionally bearing 1 or 2 short lateral branches at the base; peduncles slender, 1--1.5 cm. long or less, densely short-pubescent with dark-brown hairs; rachis slender, densely canescent-pubescent or brunnescent-pubescent even in fruit; pedicels filiform, 1 mm. long or less, elongate to 2 mm. (or longer) in fruit, densely short-pubescent; bractlets few, more or less foliaceous, to 1 cm. long and 5.8 mm. wide, densely pubescent, usually absent; prophylla setaceous, about 1 mm. long, densely short-pubescent; calyx campanulate, about 3.6 mm. long and 3.3 mm. wide, pubescent, plainly 5-costate, its rim 5-dentate, the teeth broadly triangular, about 0.5 mm. long and at the base 1.3 mm. wide; corolla hypocrateriform, its tube about 3.6 mm. long, about 1.5 mm. wide at the base, ampliate to 4.6 (!) mm. at the apex, glabrous outside, densely tomentose in the throat within, its lobes 5, rounded-elliptic, about 2.8 mm. long and wide, venose, pubescent, rounded at the apex; stamens 4, inserted about 1.3 mm. below the mouth of the corolla-tube, included, not distinctly didynamous; filaments about 0.5 mm. long; anthers ovate, about 0.5 mm. long and wide; pistil included; style about 1.5 mm. long, glabrous; stigma very shortly 2-lobed; ovary minute, subglobose; fruiting-calyx indurated, cupuliform, to 2.5 mm. long and 6 mm. wide, lightly short-pubescent or puberulent. its rim truncate, obscurely 5-angulate; fruit subglobose, about 6 mm. long and wide, black and very shiny in drying, fleshy, glabrous.

The type of this species was collected by Morley Thomas Dawe (no. 373) -- in whose honor it was named -- at Chipaque, Antioquia (?), Colombia, in July, 1916, and is deposited in the her-

barium of the Royal Botanic Gardens at Kew. The common name "agrecejo" is recorded by Dawe, but this name is also applied to C. fruticosum L. The species has been collected in anthesis and in fruit in July. It is apparently closely related to C. karsteni Moldenke, and has been confused with C. subthyrsoideum Pittier in herbaria. The Karsten specimens cited below differ in their denser pubescence on the lower leaf-surfaces, their generally narrower leaf-blades, and especially in the conspicuous vein and veinlet reticulation on both surfaces of the mature leaves. In the type collection the vein and veinlet reticulation is very obscure or even indiscernible. In the Karsten specimens the (immature) fruiting-calyx is also more distinctly 5-apiculate-toothed. Nine herbarium specimens, including the type, and 6 mounted photographs have been examined.

Citations: COLOMBIA: Antioquia?: Dawe 373 (B--photo of type, K--type, K--isotype, N--isotype, N--photo of type, S--photo of type, W--1423187--isotype, Z--photo of type). Boyacá: Karsten s. n. [Sogamoso] (N--photo, V, Z--photo). VENEZUELA: Anzoátegui: Karsten s. n. [Piritu] (V). Delta Amacuro: Curran & Haman 1309 (Ca--924130), 1316 (Ca--924040, Ve--12548),

CITHAREXYLUM DECORUM Moldenke in Fedde, Repert. Sp. Nov. 37: 221--222. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 221--222. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Pittier, Supl. Plant. Usual. Venez. 54. 1939; Moldenke, Geogr. Distrib. Avicenn. 20. 1939; Moldenke, Alph. List Common Names 30. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 32 & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 62 & 179. 1949; Moldenke, Alph. List Cit. 3: 820 (1949) and 4: 1050. 1949.

Small tree; branchlets medium-stout, rather acutely tetragonal, light-brown, very medullose, densely velutinous-pubescent; twigs somewhat more slender, otherwise similar to the branchlets in all respects; nodes obscurely or not at all annulate; principal internodes 1.2--6.5 cm. long; leaf-scars on larger branchlets and twigs borne on prominent, ascending, corky sterigmata to 3 mm. long and wide, subsessile on the youngest twigs and shoots; leaves decussate-opposite; petioles stout, 6--12 mm. long, densely velutinous-pubescent like the branchlets, with light-brown hairs to 1 mm. long, canaliculate above; leaf-blades firmly chartaceous, bright grayish-green and shiny above, deeper green beneath, elliptic, 7--14.7 cm. long, 4--6 cm. wide, acuminate at the apex (rarely obtuse on smaller leaves), entire, acute at the base and slightly prolonged into the petiole, bearing a pair of elongate glands at the very base, densely short-pubescent above, densely velutinous-pubescent beneath with straight light-brown hairs to 1 mm. long (or less); midrib rather stout, short-pubescent above, very prominent and much longer-pubescent beneath; secondaries slender, 5--8 pairs, ascending, almost straight (not arcuate), often furcate, prominulous be-

neath; vein and veinlet reticulation fine, abundant, prominulous beneath, often somewhat obscured by the velutinous pubescence; racemes terminal, unbranched, erect or pendent, 6--14 cm. long, 2--3 cm. wide in fruit, very densely many-flowered; peduncles slender, 1.7--3 cm. long, densely velutinous, often with a node and a pair of small caducous bractlets near the middle; rachis slender, densely velutinous-pubescent with light-brown hairs like the leaves, petioles, and branchlets; pedicels (in fruit) slender, 2--3.5 mm. long, densely pubescent; bractlets few, linear, about 4 mm. long, densely pubescent; prophylla linear, to 1.2 mm. long, densely pubescent; flowers not seen; fruiting-calyx indurated, cupuliform, 4--5 mm. long, about 5 mm. wide, closely investing the fruit, densely velutinous-pubescent, its rim deeply 5-lobed, the lobes about 2 mm. long and 3 mm. wide at the base, blunt at the apex, scarious-margined; fruit oblong, about 7.1 mm. long and 4.6 mm. wide, fleshy, orange-red when fresh, brown and wrinkled in drying, 2-lobed, apiculate at the apex by the persistent style, glabrous, shiny.

The type of this handsome species was collected by Henri François Pittier de Fábrega (no. 10769) on the ascent from Motatán bridge to Carvajal, near Valera, Trujillo, Venezuela, on November 21, 1922, and is deposited in the United States National Herbarium at Washington. The common name "totumillo" is recorded by Pittier in the reference cited above, but is a name also applied to Aegiphila mollis H.B.K., Vitex compressa Turcz., V. divaricata Sw., and V. orinocensis var. multiflora (Miq.) Huber.

This is a most handsome and distinct species because of its velutinous-pubescent branchlets, petioles, leaf-blades (especially the lower surface), peduncles, rachis, and calyx. The glands in this species, as in many other species of the genus, are borne on the lower surface of a narrow prolongation of the leaf-blade which extends a short distance down the petiole and has its margins strongly revolute so as almost to hide the elongate glands inside. The glands themselves are elongate in a direction parallel to the midrib and petiole. The species was confused by Pittier with C. tomentosum H.B.K. [= C. kunthianum Moldenke]. Six herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: VENEZUELA: Trujillo: H. Pittier 10738 (Ve), 10769 (B--photo of type, Cb--isotype, G--isotype, K--photo of type, N--isotype, N--photo of type, S--photo of type, Ve--12656--isotype, W--1187364--type, Z--photo of type).

CITHAREXYLUM DENTATUM D. Don, Edinb. New Philos. Journ. 11 (Jan.-Mar.): 237. 1831.

Synonymy: Rauwolfia dentata Tafalla ex D. Don, Edinb. New Philos. Journ. 11 (Jan.-Mar.): 237, in syn. 1831. Rauwolfia dentata Tafalla ex Walp., Repert. 4: 73, in syn. 1845.

Literature: D. Don, Edinb. New Philos. Journ. 11: (Jan.-Mar.): 237. 1831; Walp., Repert. 4: 73. 1845; Schau. in A. DC., Prodr. 11: 609. 1847; Jacks., Ind. Kew. 1: 549. 1893.